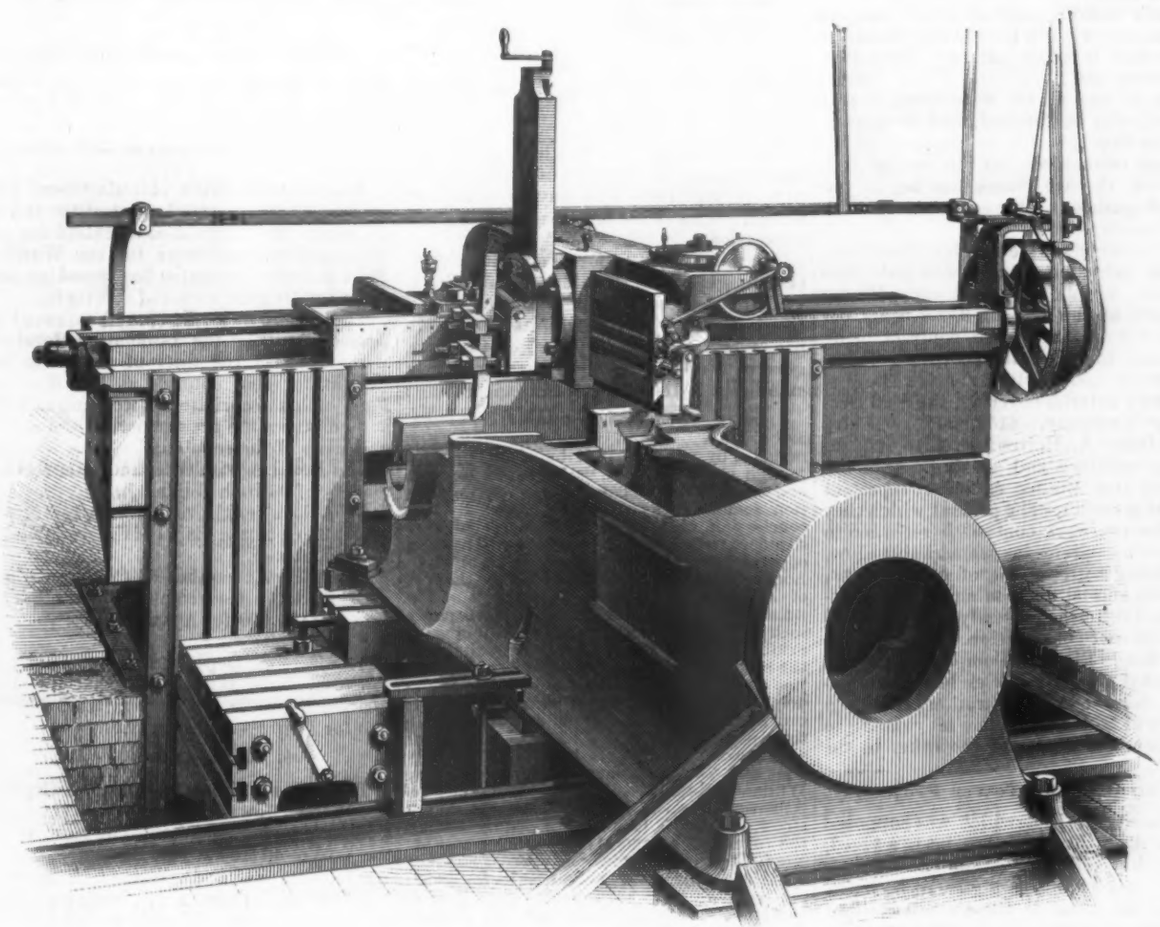
THE IRON AGE

THURSDAY, OCTOBER 22, 1891.

The Richards Open-Side Planer.

The engraving on this page shows one of the many uses to which the Richards open-side planer, built by Pedrick & Ayer of Philadelphia, can be put. A general description of the machine and of the variety of work it is doing at the Ball Engine Works, Erie, Pa., will be of interest. The overhanging arm extends so that with a straight cutting tool it will plane 36 inches wide and 8 feet long. This arm is made very deep and is strongly braced, and carries a slide that will plane down 24 inches, this being provided to suit one particular valve seat, which has a deep steam chest cast on the cylinder. This tool slide has automatic down and angular feed of the latest form, and is driven by a 3-inch double-pitch screw with pulleys geared direct on the end. A large pulley drives the tool cutter, and is 24 inches in diameter, the return pulleys being 14 inches in diameter, thereby making a quick return. The machine has legs 2 feet wide at the bottom, forming a space several inches wide in line with the flat face of the bed. This space has a large T-slot, so that the plates are supported at the lower ends, and also between the legs there is bolted a heavy cast-iron beam that ties them together, while the T-slot on its side coincides with the T-slots on the legs. This construction gives the advantage of extra bolting and strength when the tables are low down, as shown in the cut. All the T-slots that support the plates and tables have heavy steel strips planed up to suit them, and into these studs are firmly screwed and fastened, thus doing away with wearing and tearing the bottom of the slots, as is the case when bolt heads are used.

There are several novel features about the feed, lengthening and shortening the stroke, and starting and stopping the travel. On top of the machine, running the whole length, are two steel racks, one of which is stationary and one movable, and attached to the belt shifters. On the shaft that has the shifting crank to operate the feeding pawls is a gear running in the stationary rack and held by friction. This shaft runs the whole width of the machine. Over this shaft is a sleeve with a gear wheel fastened to it that is driven by friction from the other gear wheel. This gear runs in the movable rack, on which is a hand wheel. By placing the hand on this wheel to stop its revolving, the carriage keeps traveling till the belt is shifted and both belts are on the loose pulleys, and the planer stops. By turning this hand wheel either way the planer will start either forward or backward, as desired. On the sleeve is a triple-pitch worm running into a worm wheel of proper size and number of teeth so that it will make one revolution to the full travel of the tool. On this worm shaft is an arm that moves the same as the worm wheel. Fastened on suitable brackets is a disk that this worm shaft passes through, and on the upper face is a circular T-slot with hand bolts and stops provided, so that when the arm strikes a stop this sleeve shaft stops revolving, the T-belt is shifted, and the return stroke takes place. When the travel is determined, the other bolt and stop are placed in position for the other return stroke. This device admits of very delicate adjustment. The cranks, starting wheel and shifting device are all within convenient reach of the operator. In the saddle are placed four phosphor-bronze nuts, giving a large wearing surface. One of these nuts is adjustable to take up wear, so as to prevent back lash on the screw. All the bearings of the screw loose pulleys are bronze lined and self-oiling. All gibs are taper and adjustable by nuts on studs. The bed for doing this particular kind of work is formed with a space left open between the legs, and extending up into the bed a short distance to allow the end of the engine beds to project through and under the machine so that this particular style of bed can be planed. As shown in the cut, the tables are lowered and a piece laid across, supporting the work. This provides means for raising and lowering the work without the aid of packing pieces, long bolts, &c. Extending along the whole front of the machine is a deep pit, on the outer wall of which is a floor plate, formed with T-slots set in line with the T-slots in the beds, the slots being connected by a cross rail, which forms a foundation upon which to lay large work. The slotted vertical plates extend some distance down into the pit, so that the table tops come level with the floor plate. It will be readily perceived that the arrangement of tables and slots is



THE RICHARDS OPEN-SIDE PLANER.

such that a casting of almost any shape can be so held as to be easily planed. This machine was designed to do all the planing of the Ball engine beds, steam cylinders, and shape up cranks, forgings, &c.

WORLD'S FAIR NOTES.

Construction work has progressed very satisfactorily during the past week. The Mines Building suffered to some extent from delay in receiving structural material from the steel manufacturers, but it is now arriving in good installments and the roof trusses will be put in place rapidly. The roof of this building will be constructed on the cantilever principle. The Horticultural Building was begun according to announcement, and work on it is already well advanced. It will be one of the most beautiful buildings on the grounds. The roof garden of the Woman's Building now shows its outlines and the gutter work for the various angles of the roof is being put in. Plastering has begun on a portion of the inside. Within 60 days all the wood work of this building will be finished, and it appears probable that this will be the first of the principal structures to be completed. Work on the Art Palace has begun and will be pushed by the contractors with great rapidity.

The contracts were let for Machinery Hall, as indicated by the bids published last week, as follows: Iron work, Binder & Seifert, at the rate of 3.698 cents per pound, the amount of this contract being estimated to aggregate $350,000; sheet-metal work and skylights, Louis Biegler, $118,000; exterior covering, the Staff Decorating Company, $159,000; carpentry work, James A. McGonigle, $318,800, including painting and glazing. It is understood that Binder & Seifert represent Cofrode & Saylor. The price at which they took the iron-work contract is regarded in engineering circles as remarkably low, there being a great deal of curved work, requiring special labor in shaping and fitting, and differing radically from standard bridge or roof construction.

The Crane Elevator Company have been awarded the contract for eight electric elevators for the Administration Building. There will be two sets, one set running to the colonnade floor and the other to the dome.

Revival of the Tower Project.

The tower project, which was supposed to have been dropped, has been revived, and it is "positively" announced now that a tower 1120 feet high will be built. This is the hight to the top of the flag staff, the top landing being 120 feet lower. It is stated that the Keystone Bridge Company have made a satisfactory proposition to the promoters of the scheme, agreeing to have the metal portion of the tower completed by February 1, 1893. Options have been secured on grounds immediately adjoining the World's Fair grounds. The actual cost of the tower will be about $1,500,000. The cost of the Eiffel Tower was a little less than $1,700,000, with cheaper labor and with the price of steel much less than in this country. The American tower can be built for less money, it is claimed, notwithstanding its greater size and earning capacity, on account of its greater simplicity of design, in which standard and merchantable sizes of steel are used. Subscriptions and pledges, it is asserted, have been received from St. Louis, Cincinnati, Pittsburgh and other places, and it only remains for Chicago to subscribe for $200,000, the outside parties taking the place.

Transportation of Exhibits.

Traffic Manager Jaycox has secured from all but two railway associations in the United States a statement of what they will do in the way of making reduced rates on exhibits intended for the fair. Of 15 freight traffic associations in the United States representing 269 of the leading transportation lines, 13 have agreed to the free return, ownership remaining unchanged, of such exhibits as pay tariff rates on the forward journey. The bulk of the work in the direction of securing concessions in freight rates on exhibits has been with the transportation lines which are not members of the traffic associations. A very large number of these have made full rates going and granted free return, ownership unchanged.

Will Carry Goods Free.

The Quebec Steamship Company, operating the New York, Bermuda and West India Line, have announced that they will carry free the Commissioners of the Latin American Department, and will also carry without charge all collections furnished by foreign governments at the cost of handling. They will carry at half rates all articles sent by private parties for exhibition, and also carry at the cost of boarding all passengers holding through tickets to the exposition.

The Chattanooga Southern road announces a free freight rate on natural products and half rates each way on other exhibits. This is the first road making this concession.

The Atlantic Transport Line, with steamers running from London to New York, Philadelphia and Baltimore, has offered free transportation for exhibits in "handy packages." John T. Sickel of Chicago, general Western agent of the line, writes as follows to the World's Fair authorities:

I now beg to confirm our proposition to you, and to request that in the circular which it is intended by you to be distributed among your foreign representatives, or intending exhibitors, that you will make notice of our proposition somewhat as follows—to wit: By the courtesy of the Atlantic Transport Line of steamers from London, exhibitors will have an opportunity to forward their exhibits from London to the American seaboard for the cost of handling, as the general managers of the Atlantic Transport Line have promised to carry such exhibits free of freight, providing such exhibits come forward in quantities suitable to the room available on their steamers. As this line can deliver cargoes at New York, Philadelphia and Baltimore, intending exhibitors can arrange for delivery at any one of these three ports.

Shipments from points in the United Kingdom and Continent should be sent to Messrs. Williams, Torrey & Feild, agents of the Atlantic Transport Line, No. 108 Fenchurch street, London, E. C., to be shipped by them to the care of the general agent's office at New York, Philadelphia and Baltimore. Exhibitors should make early arrangements for securing room on these steamers through Messrs. Williams, Torrey & Feild and the foreign commissioners, as the amount of space available for this purpose is of necessity limited. To save expense of handling all packages should be of handy size. Special arrangements must be made for packages of unusual size or for machinery.

The Hidalgo and Northwestern Railroad Company, which is the principal transportation agency in northern and northwestern Mexico, has also notified the exposition officials that it will make no freight charges on articles sent to the exposition at Chicago.

Insurance for Employees.

The Auxiliary Committee on Insurance has practically decided that for the ensuing year it will be necessary to place, approximately, $50,000 of accident insurance. This accident insurance, it is understood, will apply to the employees of the exposition alone. The contractors for the buildings are responsible for the safety of their workmen. This leaves visitors to the World's Fair ground unprovided for; but as no one except employees secures admission to the grounds without a pass, the granting of which is conditional upon the signing away of any right for damages by the holder, it is taken for granted that such visitors cannot in case of injury claim damages from the exposition management.

Brevities.

France has asked 25,000 and the Hague 11,000 square feet of space for their picture exhibits alone. Until recently it was thought that the weakest feature of the exposition would be its fine arts exhibit Now, however, it is believed that this will be one of the best of all. Chief Ives of the Department of Fine Arts, writes from Copenhagen that he has completed his work with the artists of Denmark, and that his next visit will be to Berlin. He speaks encouragingly of the prospects of art displays from Europe. Denmark, he says, will be especially well represented.

Australia is waking up to the importance of the fair. W. S. Rae, the editor of the Melbourne *Advertiser* and the Essenden and Flemington *Chronicle*, writes to Chief Handy saying that his newspapers have published all the World's Fair literature within reach, and that the colonies will be largely represented at the exposition. Already, he says, there is a growing determination in the minds of many business and private men to visit Chicago in 1893.

The National Brick Manufacturers' Association has appointed a committee of five to secure an international exhibition of clay-working machinery for the World's Fair, and the committee has issued an address inviting the views of the trade.

The President of Uruguay has issued a decree intrusting the Association Rural of Uruguay with the duty of preparing an exhibit for that country at the World's Fair. This association is well organized, and embraces the greater part of the agriculturists of the republic.

The Royal Agricultural and Commercial Society of British Guiana has decided to hold a local exhibition of its resources preliminary to the display it intends making at Chicago.

The Vienna Chamber of Commerce has petitioned the Government for a subvention of $125,000 for Austrian participation in the exhibition.

The Foreign Department is notified by telegram from Washington that the Argentine Republic has appropriated $100,000 for World's Fair purposes.

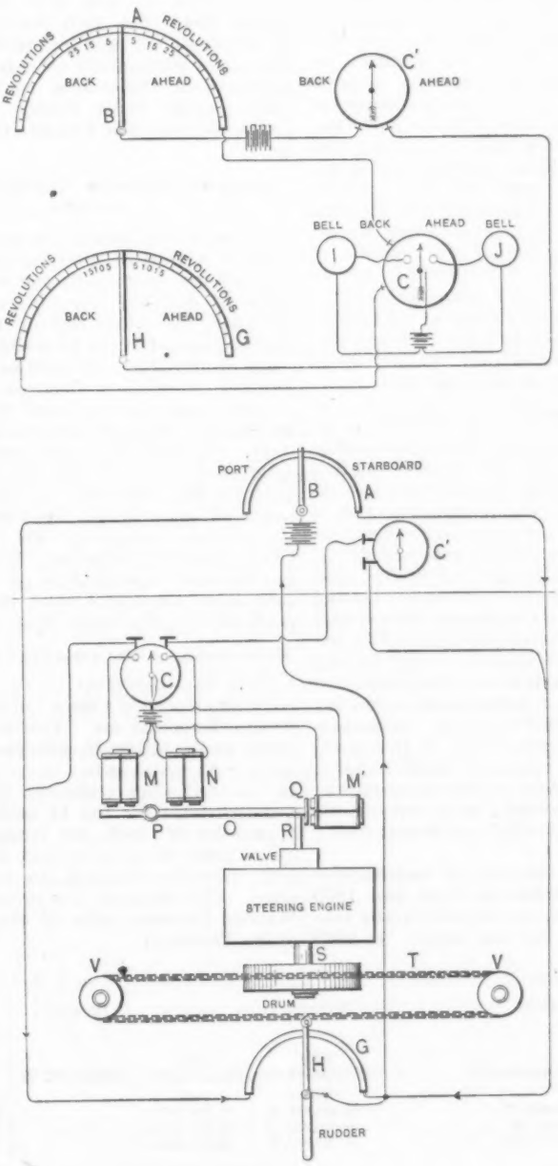
The following representatives of the W. A. Wood Mower and Reaper Machine Company have gone West: The Hon. Walter A. Wood, Howard B. Burden, E. Dudley Tibbits, Walter P. Warren, J. Russell Parsons and Truman J. Wallace. The committee named will make a visit for the purpose of inspection in and near Minneapolis. If it should be decided to locate the branch there the Hoosick Falls, N. Y., plant will be maintained also, but it would probably result in a reduction of the number of employees. A factory in the West would be for the purpose of manufacturing machines for the market west of the Mississippi. The Hoosick Falls plant would be maintained for the manufacture of machinery used in the East and for foreign markets. The freight on each machine is $4.20. For the past season the Wood Company have not been able to supply the demand for their machines in foreign countries, which will not be the case during the approaching season, for about $150,000 has been spent on increasing their plant at Hoosick Falls.

E. S. Cook of the Warwick Iron Company and J. P. Fillebrown, manager of the Montgomery Iron Company, have just completed a series of tests of the fire-brick stoves of the latter company. They found as the average of 12 trials a variation of only 15° in one hour's blow.

Engine and Helm Control.

The present means of communicating directions from the captain or the officers stationed on a steamer's bridge to the engineer or machinist on watch in the engine room, or to the quartermaster at the wheel, are either mechanical or electrical. The mechanical devices are, as a general thing, cumbrous in construction, difficult to operate and quite easily put out of order. The electrical devices are almost always complicated and in addition are very expensive. There is, and has been for years past, urgent need for a simple apparatus by means of which the person directing the movements of a vessel may not only communicate his orders instantly, but may know with certainty that they are understood and are being executed. This is of the greatest importance aboard war ships, where the outcome of a conflict in favor of one side or the other may be dependent upon the rapidity and facility with which the opposing vessels are handled.

It is a serious objection to the existing modes of intercommunication that they do not enable an order to be transmitted with sufficient accuracy. Thus it is quite possible to send a signal to put the helm, for example, to "port" or to "hard aport" and to instruct the engineer to "back" or "go ahead" fast or slow, or to stop. But there is no reason why much more specific instructions should not be sent, by means of which the vessel may be more accurately controlled. This point receives particular emphasis when several vessels are cruising together or indulging in tactical maneuvers. In this case almost continuous engine speed changes are required to enable the vessels to maintain proper distance. Furthermore, in action, with casualties constantly occurring, it is exceedingly important for the commanding officer to know that his orders have been clearly understood and implicitly obeyed. The more automatically this intelligence can be conveyed the greater the immunity from error and the more rapidity possible.



ENGINE AND HELM CONTROL.

After a great deal of practical experience afloat and much study of the subject, Lieut. Bradley A. Fiske, United States Navy, has recently developed a signalling system of great ingenuity, which brings the guns of the battery, the helm and the engine room much more completely under the control of a single person than has ever hitherto been accomplished. The system includes numerous arrangements of apparatus, which are quite well represented in the accompanying diagrams. The system as here given is for use for controlling the engine or the helm. In a somewhat modified form it could be readily adapted for transmitting from the observer to the gun captain the distance the target is from the firing position, as determined by the clever range finders that have been adopted by our navy department and that of several of the foreign powers.

Referring first to Fig. 1. Here are shown two arcs of conducting material, over which move two pivoted arms, B and H. The arcs are graduated on each side of their central points to indicate the revolutions made by the propeller of the vessel. The arcs and arms are connected in series with two indicating instruments; one arc and one indicating instrument being located, for example, on the vessel's bridge or in the conning tower, the other one in the engine room. In connection with the needle of the instrument of the engine-room indicator are arranged two local circuits, each containing a bell or other suitable alarm, which circuits are respectively closed as the needle moves to its stops in one direction or the other.

If the apparatus be arranged as indicated in the diagram, the arms being at the middle points of their arcs, and it be desired to send a signal to the engineer to "go ahead," the arm B should be moved to the right. By this means the resistance in the circuit is diminished, causing a deflection of the needles of the two indicators in the same direction. The engineer then not only sees the needle of his indicator move, but also hears a bell sound. And as this bell may be of different tone, for example, from the one included in the other local circuit, he has both visible and audible notice of the order. Meanwhile, the person sending the order notes by the deflection of his indicating instrument that it has been transmitted.

Now suppose further that it be desired to have the vessel go ahead at slow speed. The speed of the vessel for a given number of revolutions being approximately known, the person sending the signal moves the arm B, for example, to the mark 15 on the arc A. The results already referred to will then occur. The engine-room bell will, however, continue ringing and the needles of the indexes will remain deflected until the engineer re-establishes the balance of the circuit. This he does by moving the arm H on his arc G to the right to the number 15. He will thus obviously have thrown into the circuit a resistance equal in amount to that by which the total resistance in the circuit had been diminished, thus restoring the normal condition. The needles of the indexes will them return to their normal position, the alarm will cease sounding, and the person sending the signals will be apprised that his order has been exactly complied with. By this device an exceedingly accurate and certain mode of regulating the speed of the ship is at all times available, and confusion resulting from hastily given and but partially understood orders is done away with.

In order to directly control the helm so that the rudder may be adjusted at any exact and desired angle, and also to cause knowledge that the order transmitted has been correctly executed, the apparatus shown in Fig. 2 was devised. It is an automatic means of controlling the helm directly and without the intervention of any one but the person sending the signal.

In this case, as in the one already described, there are two arcs, A and G, over which move pivoted arms, H and B. These arcs are connected in Wheatstone bridge circuit with a battery and with two indicating instruments, one of which is located at the sending station and the other one near the steeering engine which controls the helm. No particular form of steering engine is required; any one of the standard patterns already in use will do. For example, take one that operates a drum,

S, around which pass chains that are shackled to the tiller H, when the engine turns in one direction the tiller moves one way, and when it turns in the opposite direction the tiller moves the other way. The arm H on the arc G may be the tiller itself or an arm actuated by the tiller.

The two local circuits, which are closed by the movement of the needle of the indicator C, in one direction or the other, include electro-magnets, M and N, which operate a pivoted armature that in its turn moves the reversing valve of the engine. The magnet M' is connected in circuit to the battery which controls the two local circuits, and serves to center the valve, when the parts are in normal position, as indicated in the diagrams. Now, when it is desired to put the helm in one direction or the other, the person stationed at the arc A simply moves the arm B in the direction in which it is desired to adjust the helm and also to the desired extent. This immediately disturbs the balance in the circuit, and the fact, as before explained, is shown on the indicator C' near him, while the needle on the distant indicator closes one of the local circuits, energizes one of the electro-magnets M or N, which in turn, attracting the pivoted armature O, moves the valve of the steering engine so as to cause it to move the tiller, and hence the rudder, in the desired direction. As soon as the rudder or the tiller H moves over its arc to an extent sufficient to re-establish the balance in the circuit, the parts return to their normal position, when the electro-magnet centers the armature and stops the engine. The operation, obviously, is thus entirely automatic, and the ship is steered merely by the movement of the arm B.

Changes in Western Freight Rates.

The General Freight Committee of the Central Traffic Association held a session last week in Chicago and decided a number of questions which have been pending for some time. The committee decided that, taking effect October 26, sixth class rates be authorized on structural iron or steel and on iron or steel bridge material, carloads, to apply between all points in the territory of the association. It was decided to advance the present rate of $2.20 per ton on pig iron from Jackson, Wellston, Ashland, Ironton and Hanging Rock, Ohio, to Joliet to $2.40 per ton. It was also agreed to apply a proportional rate of $2 per ton on pig iron from Ironton, Ohio, to Buffalo, N. Y., to be used only on business coming from points south of the Ohio River and not on traffic originating at Ironton. The committee recommended that the application of the Cincinnati Freight Association for rate on pig iron and kindred commodities, Cincinnati to Chillicothe, Ill., of $1.75 per ton be authorized. It was decided to recommend that the application of the Pittsburgh committee to apply Peoria rates on shipments of skelp iron from the Pittsburgh district to Kewaunee, Ill., be authorized. The committee agreed that on traffic originating at St. Paul and Minneapolis, forwarded via Peoria, and destined to points in the Central Traffic Association on the south of the line of the Lake Erie and Western road, and on and west of a line drawn from Lima to Columbus, Ohio, Chicago rates may be applied. Regarding the request of the Southeastern Mississippi Valley Association that the Southern classification be adopted on traffic from all points in the territory of the association to Southern points it was decided that the application of the Southern classification be confined to the boundaries within which it is already authorized—namely: All points west of a line drawn from Cincinnati, Ohio, to Hamilton, Richmond, and Anderson, to and including South Bend, Ind.

THE EFFECT OF THE TARIFF.

We are indebted to S. G. Brock, chief of the Bureau of Statistics, for a copy of a pamphlet showing statistically the volume and value of our imports and exports since the enactment of the new tariff law and its practical effects upon our foreign commerce. During the 11 months from October 1, 1890, to August 31, 1891, under the operation of the new tariff law, the total value of our foreign commerce, imports and exports of merchandise combined was $1,603,782,266, or an increase of $74,768,639 over the value of our foreign commerce during the corresponding period of the prior year, when it was $1,529,013,627. The average annual increase of our foreign commerce (imports and exports of merchandise) during the 20 years from 1871 to 1891 was $38,314,352. It will be observed that the increase during the first 11 months under the operation of the new tariff was nearly double this average annual increase. Of the total commerce of the 11 months ending August 31, 1891, the value of our imports of merchandise was $763,210,965, an increase of $25,681,316 over the value of the imports of the corresponding months of the prior year, and the value of the exports was $840,571,301, an increase of $49,087,323 over the prior period.

Imports Free of Duty.

The value of merchandise imported free of duty during the 11 months ending August 31, 1891, was $364,661,336, as compared with $252,648,255 imported free of duty during the corresponding 11 months of the prior year, an increase of $112,013,081 during the first 11 months after the enactment of the new tariff. During these 11 months the portion of merchandise admitted free of duty was 47.78 per cent. of the total imports, while for the corresponding months of the prior year the proportion of merchandise admitted free of duty was 34.27 per cent., an increase of 13.51 in the percentage of free goods imported under the new tariff. This is the greatest in amount and percentage of merchandise admitted free of duty in the history of our foreign commerce during any similar period.

The value of imports of merchandise free of duty during the fiscal year 1890 was $265,668,629, the largest in any year in the history of our commerce. In 1889 the value of imports of free goods was $256,487,078. In comparison with these entire years, it will be observed that the value of imports of free merchandise for the first 11 months, under the new tariff, was $98,992,707 greater than for the year 1890 and $108,174,258 greater than for the year 1889. It should also be considered that sugar, one of the principal articles of imports, both in quantity and in value, was not admitted free of duty until April 1, 1891, and from that date the value as well as the percentage of merchandise admitted free of duty has been greatly increased. This will be seen if comparison be made of the imports of merchandise for the five months since April 1, 1891, with the corresponding period of 1890.

The value of the imports of merchandise for the five months from April 1 to August 31, 1891, was $359,725,209, of which $200,533,497, or 55.75 per cent., was free of duty, much the largest per cent. in the imports of merchandise free of duty in the entire history of the Government. During the corresponding five months of 1890 the value of the imports of merchandise was $356,234,866, of which $118,521,444, or only 33.27 per cent., was free. This shows an increase in the value of free merchandise of $82,012,053, and of 22.48 in the percentage thereof, during the five months ending August 31, 1891, over the corresponding period of 1890. The articles of free merchandise upon which there was such an increase are largely those not produced in this country, necessities which daily enter into the consumption of the people, such as sugar, coffee, crude india rubber, chemicals, drugs, &c., hides and skins, fruits, nuts, &c.

Dutiable Imports Under the New Tariff.

During the 11 months from October 1, 1890, to August 31, 1891, under the operation of the new tariff, the value of imports of dutiable merchandise has been $398,548,629, while during the corresponding period of the preceding year the value of dutiable merchandise was $484,881,394, showing a decrease for the 11 months under the new tariff of $86,331,765 in the value of merchandise paying duty. It may be noted that the total value of the imports for the 11 months, $763,210,965, exceeded in value the imports of any year in the history of our Government, excepting the fiscal year 1890, when their value was $789,310,409. If, however, the imports of September, 1891, equal those of August, the total imports will largely exceed those of 1890.

Reduction of the Customs Revenue.

Since the enactment of the new tariff law there has been a large reduction in the revenue from customs. This was contemplated in the bill itself, which recited at its head, "An act to reduce the revenue," &c. In the following statement the receipts from customs for the 12 months ending September 30, 1891, are compared with the receipts of a like period of the prior year, when the old tariff law was in operation. The statement was prepared by the Warrant Division, office of the Secretary of the Treasury:

Quarters.	Receipts from customs.		Increase.	Decrease.
	1889.	1890.		
Quarter ending December 31	$51,826,114.09	$55,444,576.81	$3,618,462.72	
	1890.	1891.		
Quarter ending March 31	60,960,891.37	57,726,297.28		$3,234,594.09
Quarter ending June 30	58,606,883 07	38,377,424.05		20,229,458.02
Quarter ending September 30	66,304,604.92	44,753,768.82		21,550,836.10
Totals	$237,698,492.45	$196,302,066.96		$41,396,425.48

It will be observed there was during the year a reduction in the customs revenue of $41,396,425.49, notwithstanding there was a large increase in the imports of merchandise. This large reduction in the revenue occurred during the last three quarters of the year included in the statement. The increase that appears in the first quarter occurred in October, 1890, the month in which the new tariff went into effect. The new law did not go into effect until the 6th, and the imports of merchandise and the withdrawal of merchandise from warehouse immediately prior to that date were very large. The reduction of the revenue from customs during the three quarters ending September 30, 1891, as compared with the same period of the prior year, was $45,014,888 21, but in considering the state-

ment of the whole 12 months this amount is cut down by the increased revenue collected during the first quarter, which occurred in October, as mentioned above. It will be remembered, however, that the principal article of our imports of merchandise from which the duty was removed is sugar, and by the provisions of the new tariff law the removal of this duty did not take effect until April 1, 1891. During the two quarters since that date it will be seen that the reduction in customs revenue as compared with the same period of the prior year amounted to $41,780,294.12.

From this it will reasonably appear that the reductions for an entire year will be fully as large, if not in excess of the amount contemplated in the enactment of the new tariff law. It further appears from the above table that the total receipts from customs during the 12 months prior to the passage of the new tariff were $237,698,492.45, and for the first 12 months after the enactment of the new tariff law the receipts were $196,302,066.96. The customs revenue collected during the first period of 12 months per capita of population was $3.80, and during the second period $3.07, or a reduction per capita of 73 cents. The reduction in customs revenue has been greatly accelerated since April 1 last, when the duty was removed from sugar. It appears from the table that the customs revenue per capita of population collected during the six months ending September 30, 1891, was only $1.30. If the customs revenue collected during the following six months ending March 31, 1892, should be in the same proportion, the customs revenue per capita collected during the year ending with the latter date would be only $2.60, or a reduction of $1.20 per capita of population in customs revenues collected for that year. This would be the lowest revenue per capita collected from customs for the 25 years since 1864, and $1.28 per capita less than the annual average rate of duty collected during that period on imported merchandise, which was $3.88 per capita.

Exports Since the New Tariff.

The value of our exports of domestic and foreign merchandise during the first 11 months ending August 31, 1891, after the new tariff, was $840,571,301, and $49,087,323 larger than the exports of like merchandise for the corresponding 11 months of the prior year while the old tariff was in force, when they were of the value of $791,483,978. This increase of $49,087,323 in our exports during the 11 months ending August 31, 1891, was nearly two and one-half times greater than the annual average increase of exports of merchandise during the 20 years prior to 1891, which was $20,750,425. During the same 11 months of 1890–91, the value of the exports of merchandise has exceeded the value of the imports by the sum of $77,360,336. The importance of this large excess of exports over imports will be appreciated when it is compared with the excess of exports of the fiscal year 1890, when it was $68,518,275. In 1889 the balance of trade was against us, and the imports exceeded the exports $2,730,277. In 1888 the balance against us was still larger, and the imports exceeded the exports $28,022,607. It will be observed that the increase in the value of our exports of merchandise is large and very gratifying. This value of our exports for the 11 months ending August 31, 1891—viz., $840,571,301—exceeds the value of the exports for any year in the history of our commerce, except the fiscal years 1881 and 1890. The value of our exports for the 12 months ending August 31, 1891, which includes September, 1890, and the first 11 months under the new tariff, was $909,264,438, or, in round numbers, about $7,000,000 greater than during any previous fiscal year.

Character and Value of Exports.

If the character and value of the exports for the 12 months ending August 31, 1891, which includes the month of September prior to the enactment of the new tariff law, are compared with the corresponding months of the prior year, the results will be found to be marked and very satisfactory. The value of the exports of the agricultural products during the 12 months ending August 31, 1891, was $665,711,263, against $630,425,046 for like period of the prior year, an increase of $35,286,217. The exports of manufactured products amounted to $170,560,311, as against $150,577,041 for the prior period, an increase of $19,983,270. The combined increase in these two classes of exports amounted to $55,269,487. During the month of August, 1891, there was an increase in the value of exports of the products of agriculture as compared with August, 1890, of $15,999,952, and an increase of manufactures of $509,552. There was also an increase in the products of fisheries and of miscellaneous products.

Imports and Exports under Reciprocity Treaties.

The reciprocity clause of the new tariff is opening new markets and increasing the demand for our products. During the year ending June 30, 1890, our exports of domestic products to Brazil amounted to $11,902,496, and in 1891 to $14,049,273, an increase of $2,146,777. The treaty with Brazil went into effect April 1 last, and it is not to be expected that the results will be very marked as yet. During the five months ending with August 31, 1890, our domestic exports of merchandise to Brazil amounted to $5,133,590, and during the same period of 1891, under the operation of the reciprocity treaty, to $6,303,182, an increase of $1,169,592. During the month of August last alone, as compared with August, 1890, there has been an increase in the value of our exports of merchandise to Brazil of $702,903. This increase in exports to Brazil since the reciprocity treaty went into effect has been mainly in locomotives, steam engines, machinery and cars for tramways and railways, wheat flour, bacon, boards, deals, planks, &c. There has been a decrease in the exports of wheat, lard and cotton manufactures. Our trade with Brazil will doubtless continue to largely increase. The reciprocity treaties with Santo Domingo and with Spain concerning trade relations with Cuba and Puerto Rico did not go into effect until September 1, and as yet there are no available statistics to show the effects of the treaties upon our commerce. These will appear later on, and will probably show an increased demand for our products. During the year ending June 30, 1891, the value of our imports of merchandise was, from—

Cuba	$61,714,395
Puerto Rico	3,164,110
Santo Domingo	1,610,360

During the same period the value of our exports to these same countries was, to—

Cuba	$12,224,888
Puerto Rico	2,155,234
Santo Domingo	1,023,751

Our imports from these islands consist principally of sugar and molasses, tobacco and manufactures of, and fruits and nuts. Our exports to these islands are chiefly of provisions, comprising meat and dairy products, breadstuffs, manufactures of iron and steel. As these islands have imported from other countries largely of these and other articles, and by the recent reciprocity treaty the heavy tariff has been in part or in whole removed from the products that will be exported to them from the United States, it is a reasonable conclusion that there will be a marked increase in our exports of agricultural and manufactured products, more nearly equaling our large imports from these islands.

The Largest Lake Dry Dock.

The Detroit Dry Dock Company have just completed what is claimed to be the largest dry dock on the lakes. It is situated in Detroit, foot of Orleans street, where the offices, saw mill, engine, boiler and general repair yards of the Detroit Dry Dock Company have been located during the past 40 years.

A. J. Dupuis carried out the work in its entirety, under the supervision of J. C. Parker, superintendent of the Orleans street yard. The soil at this point is fine blue clay, which has enabled the work to progress without interruption from landslides or leakage of water. Two thousand piles have been driven in the dock. Loaded ships carrying a cargo of 3000 tons can be safely docked and those of the largest dimensions can be easily taken in.

The inside dimensions are 378 feet long, 91 feet wide on top, 78 feet opening at entrance, 54 feet opening on miter sill, 55 feet wide on floor, 16 feet 6 inches of water over keel blocks, 16 feet 6 inches of water over sill, 4 feet 6 inches from top of keel blocks to floor of dock, 20 feet 6 inches from water line to floor of dock.

The keel and bilge blocks are 5 feet from center to center, averaging 5 feet high, thus leaving plenty of room under a ship for the movements of workmen in making any necessary repairs to her bottom. There are two wells 12 feet deep situated at each end of the dock, with cranes above them for hoisting out and replacing wheels, &c. The caisson gate which, when closed, shuts off the ingress or egress of water, is of steel, constructed at the company's steel shipbuilding plant at Wyandotte, Mich. It is 12 feet beam, 79 feet 5 inches long, with five 30-inch valves for flooding the dock, which it is estimated it will do in 20 minutes. Time required to pump the dock out is 1½ hours. The whole dock is surrounded with a puddling wall filled with blue clay 5 feet thick and extending down below the old river bed, which completely shuts off all water from leaking through the sides.

The pumping plant, which is very complete, consists of two centrifugal pumps, with 30 inches discharge each. These are driven by two 150 horse-power independent compound Westinghouse engines. These pumps are in a well 22 x 11 feet inside and 35 feet deep, the water passing from the dock to the well through a brick tunnel 5½ feet diameter and 55 feet long. The steam for the engines is supplied by a battery of three boilers, 5½ feet in diameter and 15 feet 6 inches long, built by the Dry dock Engine Works. The fuel is oil, and the whole pumping plant is housed in a two-story brick building, 34 x 81 feet. A dynamo room is provided, where an electric light plant will be put in during the coming winter, which will supply the entire shipbuilding plant with light. The second floor of the building will be utilized by the workmen at noon and other hours., when work may be temporarily suspended, and will be fitted up with an eye to their comfort. This dock is large enough to take in any boat now upon the great lakes, and has been designed especially for the wide railway car ferries and passenger boats with their overhanging guards and paddle wheels. The cost of this dock was upward of $200,000. There has also been added to the Detroit Dry Dock Company' plant a pair of steel shear legs, for hoisting boilers, engines, spars, &c., from and into boats. They are located just above the new dock, are 100 feet high and have a lifting capacity of 100 tons.

Friction Feed Ratchet.

At a late meeting of the Engineers' Club of Philadelphia Wilfred Lewis exhibited a working model of a patent friction catch invented by him and applied by Wm. Sellers & Co. to their planing machines. The device was intended to take the place of the reversible toothed ratchet commonly employed on the feed rods and screws, and its special advantages were shown to consist in its superior strength and range of action. In the common form of ratchet the minimum arc of action is determined by the number of teeth, while in the new friction catch it can be reduced indefinitely to any desired amount. The same form of feeding catch is used on other machines, and is available for any purpose to which a common ratchet has heretofore been applied.

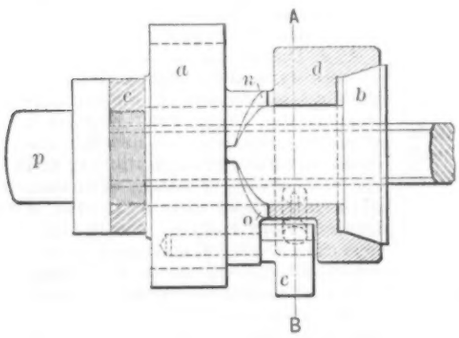


Fig. 1.—Side View

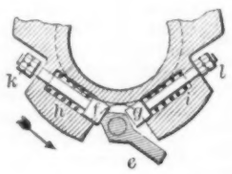


Fig. 3.—Switch Thrown Over to Feed in Direction of Arrow.

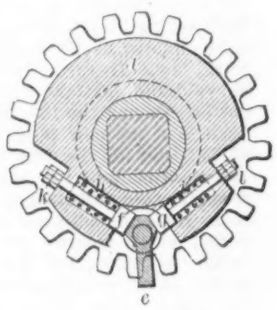


Fig. 2.—Section on Line A B.

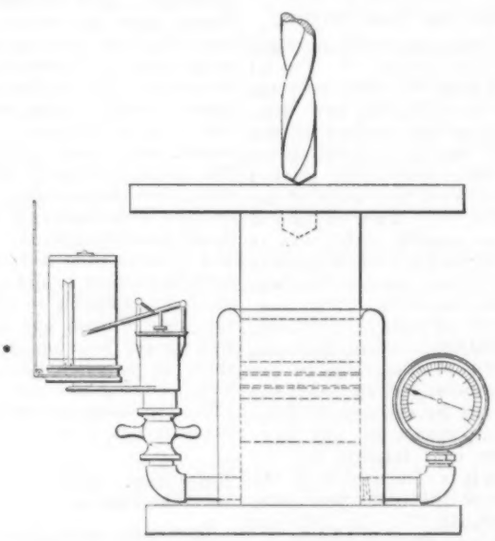
FRICTION FEED RATCHET.

The construction and operation of this feeding device can be understood by reference to the illustrations. Fig. 1 is a side view showing the engaging member *d* in section, and the right and left hand helical cam faces *o* and *n* of the driver *a*. Fig. 2 is a section of the line A B, Fig. 1, showing the switch *e* in its middle or neutral position, and Fig. 3 shows the switch thrown over to feed in the direction indicaned by the arrow. *a* is the cam-faced driver, having a reciprocating motion upon its axis. *b* is the driven member, having a coned surface at one end and the abutment collar *c* at the other. *d* is the engaging member between *a* and *b*, having right and left hand cam faces fitting against the corresponding surfaces *o* and *n* on *a*, and a coned friction surface fitting against *b*. *e* is the switch turning in *a* and forming an abutment, against which the plungers *f* and *g* may act. *h* and *i* are springs actuating the plungers *f* and *g*. *k* and *l* are stops by which the movement of the plungers is limited. *p* is the rod to which the device is required to impart motion. *a* and *d* fit loosely on the sleeve of *b*, and when the cam faces are in contact there is a slight amount of clearance between the collar *c* and the cone face of *b*. Now, if *a* be rotated in either direction relative to *b* it is evident that this clearance will be taken up, and if the motion be continued *b* will be forced to turn *a* and *d*. This is a necessary consequence, because the parts must be so proportioned that the moment of friction between the conical faces of *d* and *b* is greater than the driving moment between the helical faces of *a* and *d*. If, therefore, the engaging member is free to engage with the cam faces *o* and *n* on the driving member *a*, the driven member *b* will follow the reciprocating motion of the driver. On the other hand, if the engaging member is held in a central position relative to the driving member no movement can result, spring *h*, it is evident that when *a* moves in the direction indicated by the arrow *d* and *b* will move with it. When the motion of the driving member is reversed the engaging member is driven only by the spring *h*, and the pressure exerted therefrom on the conical surfaces of *d* and *b* being insufficient to drive the latter, the engaging member simply slips around without effect, as desired. When the switch *e* is turned in the opposite direction to that shown in Fig. 3, compressing the spring *i*, the right-hand cam faces will be brought in contact, and the catch will feed in the opposite direction.

In reporting the appointment of James B. Cooper as a member of the Michigan World's Fair Board, we referred to him as the superintendent of the Calumet and Hecla Mines. This was an error. Mr. Cooper is superintendent of the Calumet and Hecla Smelting Company of South Lake Linden, Mich.

Power Consumed in Drilling.

An interesting study of the power required to drive an ordinary drill press has been made by Prof. Lester P. Breckenridge, M.E., of Lehigh University. By means of an ingenious arrangement, which will be understood from the accompanying drawing, he was enabled to obtain all the data necessary in order to ascertain the power required in ordinary work. The forces in action are: 1, gravity; 2, inertia; 3, pressure due to the force applied to tool in order to produce the required results. The first force is scarcely worthy of mention, except in such instances as those where the larger sized tools are used and heavy work is to be handled. The second force is one demanding more attention, particularly in the case of high-speed tools. Either of these forces may be determined, however, from the known weight, speed, dimensions, &c.



INDICATING THE POWER CONSUMED IN DRILLING.

The third force, however, is not so easily ascertained, and thus the experiments which are given in detail. What pressure comes on a drill-press table when drilling cast iron with a 1-inch twist drill? The experiments were made on a drill having the following dimensions:

Diameter of table, 20 inches.

Diameter of spindle, 1½ inches.

Speed of countershaft, 250 revolutions per minute.

Diameter of pulley on countershaft, 11½ inches.

Width of belt to countershaft, 3 inches.
Speed cones, four steps.

The drill was arranged with speed lever to be operated by hand, with quick return, and machine was also back geared.

The indicator cards were taken from an apparatus, as shown in Fig. 1, consisting of a cylinder of cast iron, with flange at the base, and bored out to receive plunger. The area of this cylinder was exactly 10 square inches. Near the bottom of plunger three grooves $\frac{3}{32}$ inch deep were cut, and about $\frac{1}{2}$ inch apart, in order to prevent leakage of oil, which was placed in cylinder below plunger. Communication with oil was then made to a steam guage on one side, and an indicator on the other, as shown.

The plunger was 6 inches long and was allowed to project above the cylinder about 2 inches, with the piece to be drilled resting on top of it. The plates used for this experiment were of the following thicknesses: One-half inch, 1 inch, $1\frac{1}{2}$ inches, 2 inches. Some of the plates were planed on one side; some on both sides; some with surface as cast. The following details were taken, as shown in table:

1. Diameter of drill.
2. Depth of hole drilled.
3. Time of drilling.
4. Character of feed.

Drills used were taper shank of the following sizes: one-quarter inch, $\frac{1}{2}$ inch, $\frac{3}{4}$ inch, 1 inch and $1\frac{1}{4}$ inch. They were thoroughly sharpened and the material operated upon was of a hardness 4 upon a scale of 10, 10 representing the very hardest cast iron. The solution of the problem in hand will be found in the last two columns of the accompanying table. Besides solving the problem of mechanical pressure we also have in the accompanying table the basis for a formula showing the relation between the mean pressure of the drills and the time in seconds occupied in drilling at a given speed of drill spindle; therefore, with this table in hand, an accurate calculation may be made at any time as to capacity and time required to do a given piece of work with a given speed of drill:

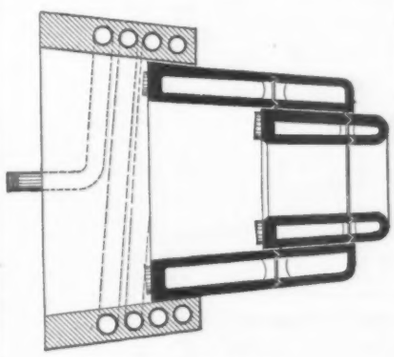
Diameter of drill.	Depth of hole drilled.	Shortest time required to drill when feeding.				Maximum pressure on drill while drilling at start.	Maximum pressure on drill when working with full diameter of drill.
		By power.		By hand			
Inch.	Inch.	Min.	Sec.	Min.	Sec	Pounds	Pounds
¼	½	0	16	0	14	400	350-400
¼	1	0	32	0	21		
½	½	0	32	0	29	900	800-900
½	1	0	30	0	45		
¾	½	0	42	0	38	1100	800-900
¾	1	1	20	1	06		
1	½	0	47	0	48	1450	1000-1150
1	1	1	32	1	47		
1¼	½	..	..	1	42	1800	1000-1150
1¼	1	3	24	3	10		

It is more than probable that if these figures were generally known more care would be exercised in regard to handling the feed lever of the drill press. It is a common occurrence to see the feed in an ordinary drill mechanically applied until the drill is stopped or broken by the amount of friction, and an obvious fact is this: That a small amount of care used in operating a drill will lengthen its life and lessen the likelihood of accident. It is a fact easily comprehended that if the above pressures are brought to bear on the drill-press table a corresponding thrust is given to the drill spindle and its bearings above.

As will be seen by reference to the foregoing table, the pressure on the table is materially lessened as soon as the full diameter of the drill has entered the metal operated upon; therefore each operation of drilling, if care is taken in starting drill, will save the wear and tear on drill of from 100 to 800 pounds, and where the drill is used one hundred times a day and this detail had in mind, there may be a saving of, say, 25 tons; the result is readily appreciated.

The Langdon Tuyere.

N. M. Langdon, furnace manager of the Port Henry Furnace Company, Port Henry, N. Y., has been using for over a year a tuyere designed by him with satisfactory results, the principal features of which will be readily understood by reference to the accompanying section. Both the tuyere and the breast are constructed in substantially the same manner. It consists of a butt and nose joined together in the manner indicated, either by soldering or brazing or by bolts. When it is desirable, Mr. Langdon interposes between the butt and the nose an extension piece consisting of concentric shells held



The Langdon Tuyere.

apart by bridges. Mr. Langdon informs us that he has used both the short and the extension tuyere. Thus far the nose piece and the extension or intermediary piece only have been new. He has used the butts of worn out tuyeres by cutting off the small end and putting on a new nose. He has not had a sectional breast in use yet, but is now making the pattern for a tuyere breast nose piece, and will shortly have a sectional breast at work. A sectional tuyere wholly new costs $1 to $1.50 more than an ordinary tuyere, exclusive of royalty. When it is destroyed at the nose it can be repaired with a new piece at a saving of about 50 per cent. on a small tuyere. The economy increases with the weight and on a breast weighing 140 to 150 pounds would amount to 75 to 80 per cent.

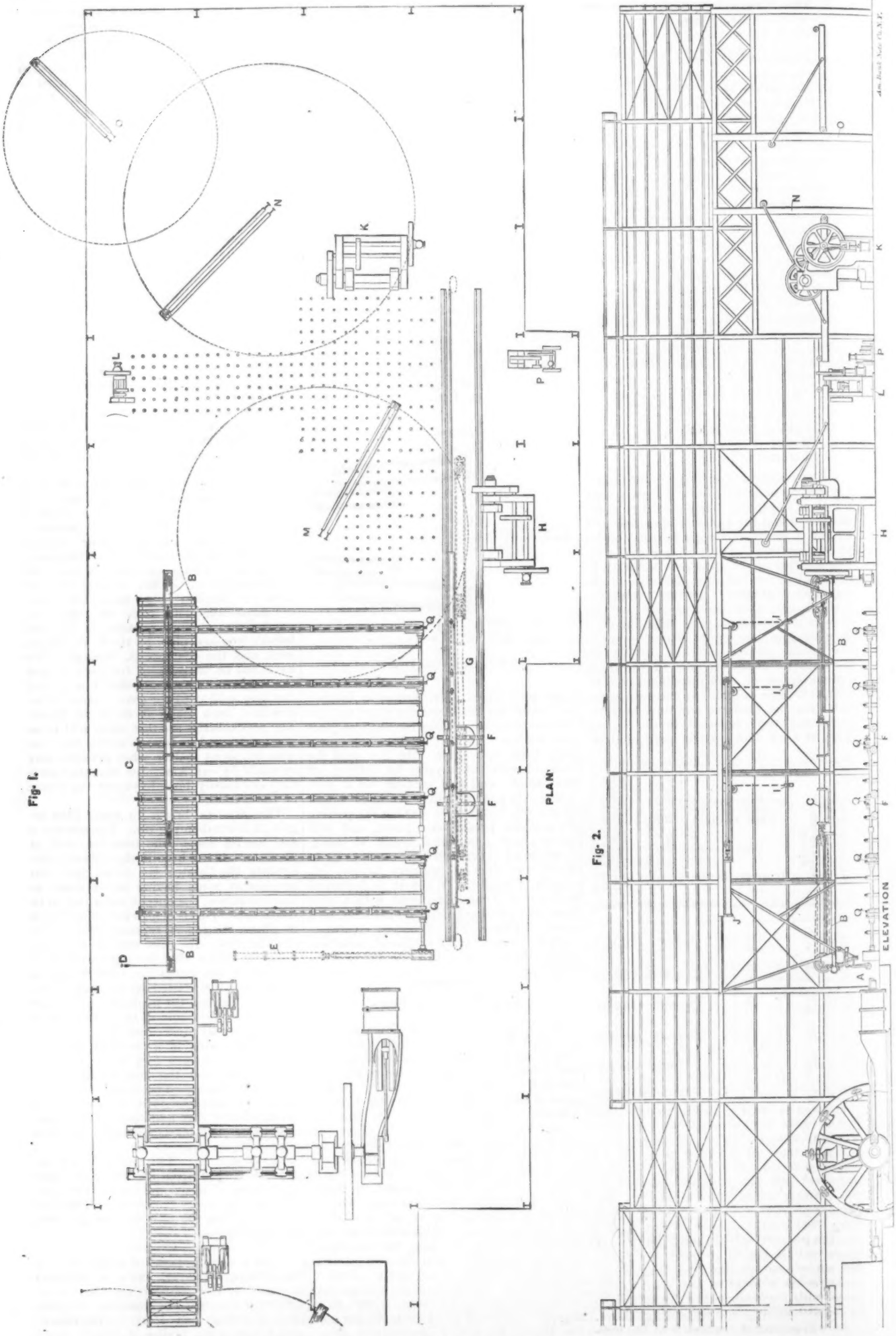
San Francisco News.

The Employers' and Manufacturers' Association of this city is gathering strength slowly but surely, but is not yet making any premature display of its power. It has now over 200 members, and it is calculated that by the close of the year its numbers will have doubled. Its very existence has, however, tended to make the federated trades more conservative and to strengthen the hands of the reasonable among their body. As to the molders' strike it seems for the present to have faded from public view, and very little is said of it either public or private. The molders burned their ships as it were, and therefore were obliged, by the supposed etiquette of the situation, either to go back with colors flying or not at all. That it is likely to be the latter is now apparent to the most casual observer. It was, in a measure, a life and death struggle, for had the Engineers' and Foundrymen's Association succumbed, their victorious opponents would have managed the shops as they liked, and all the employer would soon have to do would have been to pay whatever wages were resolved on, to work for whoever the union would have allowed him, and in general to have submitted to whatever regulations the union would have imposed. The union will no doubt keep up the semblance of its organization as long as it can, but by slow degrees the members will be scattered or absorbed in other occupations. The strike has injured all interests very materially, but business in the foundry section is beginning to revive somewhat. There has been a revival, too, in the general hardware and metal trades, with perhaps the single exception of nails, but we do not expect this department to long lag behind. The nail factory has been closed for awhile, and has not had a very large stock on hand. It has for this reason been obliged to refuse orders, some of which will go East, and some of which will probably remain permanently there. This is a great pity; because, before being troubled by strikes and lower prices, the nail industry gave great promise.

There does not appear to be much diminution in the rail movement to this city. For the two weeks just closed they embraced altogether: Eighteen cars of steel, 13 of iron, 9 of stoves, 17 of machinery, 1 of radiators, 6 of wire, 6 of pipe, 12 of hardware, 2 of castings, 1 of plows, 1 of steel plate, 1 of iron plate, 1 of scrap iron—a total of 87 carloads; besides 103,129 pounds of zinc, 14,545 pounds of copper, 1050 boxes of tin plate, 710 kegs of nails, 242 cases of nails, 65 barrels of nails. By sea we have had 600 tons of English pig iron, 100 tons of American, 250 tons of American muck bars, a large quantity of bar and bundle iron and pipe, by the S. P. Hitchcock and the Clarence S. Bement. We have had no arrivals of tin plate except that by rail. About all that has arrived has been sold at $7 for coke. Sales to arrive have been made at $6.10 to $6.15. The probabilities are that there will be as good a demand in 1892 as in the year just gone by, as no matter what progress may be made by our American manufacturers they can hardly hope to supply the whole of the market.

The Monowai brings to hand 1346 ingots of Australian pig tin. The market is and has for some time been very dull at 21 cents. It has been lately claimed that because the Cajalco tin mines have for proprietors some having an interest in English mines, the output was about to be restricted. This is denied *in toto* by Hugh Stephens, the general representative of the stockholders. He says that it is totally absurb to think that having spent about 750,000 in the mines the owners should allow this to be wasted by restricting the output. He says the management intends to develop the whole of the resources of the property by proceeding gradually and doing everything in a thorough manner. There are more men now employed than ever before, and the number is being steadily increased. The reduction in the pay roll is caused solely by the decrease of the number of men employed at the Temescal dam. On this dam it is thought that work will be able to be resumed in a couple of months. Two engineers are being sent out to inspect the works and give an estimate of the amount required to complete it. He hopes the mine itself will at no distant day be able to pay its own working expenses.

There is now in operation at the Novelty Iron Works, Dubuque, Iowa, a machine invented by C. S. Mosley for the manufacture of valves. The machine in question, in which Asa Horr is interested, makes four to six bodies of 1-inch globe valves per minute.



THE MANIPULATION OF IRON AND STEEL PLATES AT THE HOMESTEAD AND CURTIS MILLS.

The Manipulation of Iron and Steel Plates.*

BY GRAM CURTIS, PITTSBURGH, PA.

The apparatus described below for the handling of plates upon their delivery from the rolls embodies features believed to be of interest to those contemplating the building of new plate mills, and also to such owners of existing mill as may be considering the improvement of their works. The points to which attention is called are the small space required for the finishing end of the mill, and consequently the very moderate size of the building for the amount of plates handled; the directness and ease of manipulation, and therefore the small amount of labor required; the distribution of plates; the facilities and time allowed for their cooling. These, together with other features of detail and general arrangement scarcely less important, will become apparent when the descriptions and illustrations herewith given are understood.

As these devices deal with the finishing of the plates only, they may be added to any plate train when the floor space and the building are large enough to permit their introduction, and it will be obvious that the features of this method, more or less modified, are applicable to any existing mill. Figs. 1 and 2 show a three-high 32 and 19 x 120 inch Lauth mill, with hydraulic lifting tables. It is served by four heating furnaces, with hydraulic cranes for charging and drawing, not shown in the engraving.

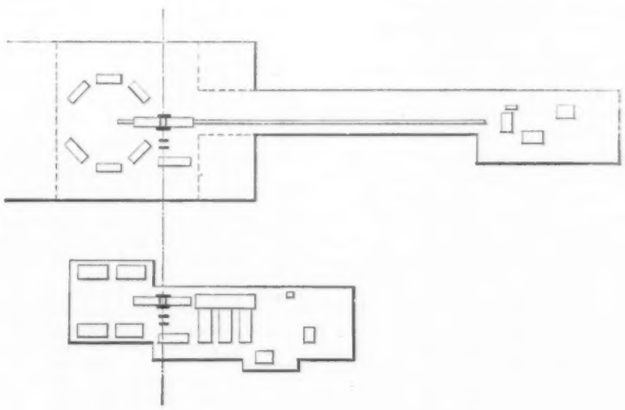


Fig. 3.—Plan of Homestead and Curtis Mills.

Upon leaving the rolls the plate is allowed to rest with its forward edge projecting somewhat beyond the end of the catcher's table. Here it is seized by the automatic tongs A suspended from a buggy travelling in the overhead trough B and actuated by the hydraulic cylinder C. These tongs are operated by a boy, who stands several feet from the heated plate and controls the long light handle D shown in the plan, Fig 1. His duty is merely to advance the tongs by means of the hydraulic cylinder C, to raise or lower them by the handle, so that their jaws come on a level with the edge of the plate, and when they have taken hold to reverse the valve and thereby draw the plate over the straightening table. The construction of the tongs is such that they open by advancing upon the plate and close upon being withdrawn. The stronger the pull the tighter their hold. They have a vertical motion of over 24 inches, and are balanced so that their elevation or depression involves no effort. They are also readily reversed, so that the plate may be seized by the other end and drawn toward the rolls should occasion require it. When the plate has reached its proper position on the straightening table it is stopped; the tongs are caused to advance upon the plate, whereby their grip is released, and they are easily thrown off by means of the long handle.

The straightening table, some 63 feet in length, is composed of heavy section railroad bars, placed about 12 inches apart and resting on heavy castings, which are bolted down upon solid foundations. The inner ends of these rails are firmly secured to the castings, while their outer ends, though held in place, are free to expand, and the supporting castings are placed so wide apart that they receive but little of the heat radiated from the plate. This manner of carrying the plate permits a free circulation of air all around it. The cooling process may be still further favored, and much radiation from the floor beneath may be cut off by covering this floor with a few inches of water, for which purpose it is depressed and paved.

From the arrangement and position of the drag out, just explained, in relation to the straightening table, it is evident that plates even up to 63 feet in length can be handled with the greatest ease. The boy conveys the plate to its proper position on the table, and here it lies, after receiving the straightening required, until its place is needed for a succeeding plate. It is then transferred laterally to the cooling bed. This bed, formed by the extension of certain rails of the straightening table, is composed of three separate elementary beds. The transfer of the plate is effected by endless chains—two to each bed—furnished with heavy conveying blocks. These blocks ride upon the rails and carry the plate with them. The spaces or divisions of the chain are, of course, sufficient to receive the widest plates that are rolled on the train. By a simple arrangement of levers and clutches (not easily shown on so small a scale) the three beds, at a moment's notice, can be made to work as one large bed, or the middle bed may be split in two, each half acting with the adjacent elementary bed, thus forming two beds of equal size. Or the middle bed may be made to act in unison with either one of the side beds, forming two beds, but of unequal size. These combinations, it will be readily seen, adapt the cooling bed to the different length of plates. For instance, in rolling plates of 20 feet or under the three beds are used; for plates from 20 to 30 feet in length, two beds; and for plates from 40 to 63 feet, one bed would be used. When a plate 30 to 40 feet in length is rolled in a run of smaller plates, it is placed on the table so as to cover the middle bed and one of the side beds, and these two beds are then worked in unison until this plate is delivered. The straightening table and cooling beds will accommodate fifteen 20-foot plates; hence, if we require five minutes for the rolling of a plate of this length, we will have one hour and a quarter as the time which may be allowed for cooling. This time, of course, would be diminished in handling longer plates. But the cooling could be gently hastened by the introduction of a series of air blasts from a fan, beneath the plates, as they lie upon the bed.

As space on the table becomes needed for a new plate, those undergoing cooling upon one or more of the beds—according to the length of the new plate—are advanced one division of the chain, thus clearing that part of the table and furnishing the room required. These beds require the services of but two men, who, by means of the levers referred to above, arrange the clutches actuating the chain wheels Q, and operate the hydraulic cylinder E under the floor, which furnishes the power for moving the plates. The same two men, by an arrangement about to be described, also turn the plate over and trim its two longer edges. The cooling bed is very low, being 17 inches above the floor at the straightening table, and rising at its delivery end to 30 inches, a very convenient hight for the laying out of plates. But the manner in which they are handled and carried before the slitting shear does away with much of the laying out that is ordinarily required.

On its delivery from the cooling bed (which is accomplished by merely advancing the chain), the plate is placed upon the buggies F F. These buggies receive the plate, each on a single line of rollers, and to facilitate its motion away from the bed these rollers have a pitch of about 2 inches to 4 feet. When the plate is well upon the buggies, the men in charge step between it and the bed. One at each buggy sets the gauge which determines the width to which the plate shall be sheared, and presses a handle, which releases a catch, and permits the inner end of the line of rollers to drop until the incline is 2 inches to 4 feet in the other direction. The plate, thus assisted by gravity, is then rolled against the gauges by a very slight effort on the part of the men. In this position it is securely clamped, and by means of another underground hydraulic cylinder, G, and a wire rope upon which the buggies have a movable grip, the plate is feed to the slitting shear H and is there cut by one of these men. The movable grip permits the buggies to be readily disengaged from the rope and placed to suit the length of the plate to be handled. A carrier or temporary buggy is set between the regular buggies when an extremely long plate is to be sheared.

As the buggies travel upon a V-shaped rail, the plate is run before the shear with great exactness, and a true cut is the result. After the cut has been made the plate is brought back to the entering side of the shear. Here by means of the suspended tongs I I and the hydraulic cylinder J it is turned over, and, after proper adjustment against the stops, it is clamped and again run before the shear. As all the heavy motions are performed by power or by the aid of gravity, the two men referred to can handle with ease plates weighing 3 tons or even more, furnishing all the labor necessary to pass them through the slitting shear, trimming their long ends and deliver them upon the caster rollers for the guillotine shear K. Here another gang takes them, cuts them to the lengths required on this shear or snapes them by the trimming shear L. The cranes M and N are for the convenient handling of heavy plates, for storing, &c. O is a crane reaching outside of the building for shipping, and P is the scrap shear.

As a condensed summary of the advantages embodied in the arrangement thus described I may mention:

* Presented at the Glen Summit meeting of the American Institute of Mining Engineers.

1. The moderate first cost (considering the output) arising from the small ground space * and the small building necessary, and from the cheap though durable nature of the machinery employed

2. The economy of operation, due to the convenience of handling and the small amount of labor required.

3. The ease with which many, if not all, the devices described may be applied to existing mills.

In this connection it should be added that although hydraulic power has been shown in the illustrations here given, the whole apparatus has also been worked out so as to be operated by a steam engine.

The Manufacture of Purves Flues.

In an account of a visit to the famous Atlas Works of Sheffield, *Engineering* describes the method adopted in the manufacture of the Purves boiler flue. There is a very extensive plant, designed especially for this purpose. The hammered or pressed slabs of Siemens steel are brought to the 32-inch breaking-down rolls, which are fitted with hydraulic gear for pushing the slabs through. The slabs are rolled down into plates, smooth on one side, but having the projecting rib on the other, the bottom roll being grooved for the purpose. The plates are of different sizes according to the size of the flue, and the ribs are placed 9 inches apart. The plates are rolled in double lengths, and are then sawn or sheared in two after passing the roughing mill. They are next taken to the finishing rolls, in which the top roll is ribbed and the bottom grooved to correspond. In this way the solid rib, formed during the first process, is hollowed out as required. The ribbed plates are then cropped to length at right angles to the ribs, the length thus forming the circumference of the flue. The next operation is to chamfer the edge so as to form a lap for welding, which operation is performed by a pair of steam shears with 12-foot blades, made by J. Buckton & Co The plates are, therefore, roughly sheared square at first and are angled off afterward. In order to make a clean cut and not crush the ribs, the end is supported by blocks which are shaped to fit, and in this way a clean cut is made with no fash.

The plates are now ready for bending to the cylindrical form, for which operation hydraulic presses are used. These consist of a fixed beam beneath which a table rises. The plate is placed on the table, and is supported by blocks at the sides. When the table is forced up by the hydraulic press the fixed beam bends the plate down between the blocks, which are placed far enough apart for the purpose. The plates are made for bending at 2-inch distances, and as an equal curvature is made at each operation the result is a cylinder sufficiently true to bring the edges together for welding. The plate has now assumed the form of a flue, and the next operation to be performed is the welding of the edges. For this purpose there are several gas furnaces of special make. The flues are placed on a traveling carriage and run up over an anvil. This anvil is carried on a horizontal projecting arm which goes inside the flue, and another horizontal projecting arm above carries the steam hammer. These two arms are attached to a vertical standard at back, and there is yet a third horizontal arm at bottom which serves to attach the whole to the foundation. The frame, therefore, has the appearance of a very deep E, the middle limb being of equal length to the other two. The length of the horizontal part has to be sufficient to accommodate the whole length of the flue in order to run the latter into the extreme end of the longitudinal weld. The hammer is carried at the end of the upper limb and the anvil at the end of the middle limb.

Immediately in front of both the anvil and the hammer—*i. e.*, on both sides of the part to be welded—there is a gas jet with air blast. This quickly brings the edges to be welded to the required heat, and the flue is fed up on the table as the operation proceeds. In making the weld the ribs are flattened down, and these are put in again at a further operation. For this purpose there is a specially formed anvil. It should be explained that there are three anvils mounted on three arms, and these may each in turn be brought into place as required, much as the different cutters are brought to bear in a capstan lathe, excepting that the rotation is in a vertical plane. The first anvil is flat for welding, the second has a tool shaped to reform the hollow rib, and the third is fitted with a movable head to allow for any special forms of rib that may be required. The machine is also generally adjustable for different sizes of flues.

The next operation is to true the flues, and this is done by hydraulic power either by a machine with straight bars acting on the same general principle as the first bending is performed, or by a powerful hydraulic rounding machine designed for the purpose. In this there are two vertical heads, which are fitted with tools the exact shape of the part of the completed flue against which they are to press. The tools are naturally struck with faces to radii which make a fair circle. Of course the inner tool has a convex and the outer one a hollow face, with projections and grooves for forming the ribs. The head which goes inside the flue is fixed, and takes the form of a pillar or column. The other head is moved up by hydraulic pressure, and in this way the flue is pressed between the two. There is a parallel motion at the sides for holding and guiding the flue, as it is rotated, to bring each part in turn between the heads. A piece within an arc of 18 inches is operated on at each movement. The flues are heated to a dull red in an annealing furnace, and are then allowed to cool in an open part of the forge, which, however, is screened from draft. Of course different descriptions of tools are used for various diameters of flue. Flanging the ends is the next operation, and this is either carried out by hand or by means of a fine double cylinder hydraulic press, recently supplied by Fielding & Platt, of Gloucester. The flues are next pickled in a bath of diluted acid to remove scale. The edges of the flanges are finally trimmed off either by band saw or slotting machine, and the flue is then ready for the boilermaker. The shops devoted to the manufacture of these flues are well served by hydraulic cranes, overhead travelers, light railways and other modern appliances for handling the work.

* The size of the mill described, as compared with the well-known mill of Carnegie, Phipps & Co., Homestead, is shown in the accompanying sketch, Fig. 3. The two mills have about the same capacity. The upper plan is that of Homestead.

Four nickel and steel armor plates by as many Sheffield manufacturers have been recently tested at Portsmouth, England, and with such apparently satisfactory results that a limited order for the supply of nickel armor to battleships in course of construction has already been issued.

Secretary Tracy and Commodore Folger of the Bureau of Ordnance were recently interested spectators at the pouring of the head of a 180-ton forging press at the works of the Bethlehem Iron Company, Bethlehem, Pa. They also saw a 13-inch rifle forged and two pieces of armor plate forged under the 125-ton hammer.

Trade Publications.

WE HAVE RECEIVED a catalogue from the Buckeye Engine Company of Salem, Ohio, illustrating the Buckeye tandem and cross-compound automatic cut-off steam engines. Arranged in tabulated form are the dimensions of the engines now built of the several types. The balance of the catalogue is devoted to demonstrating that in reduced cylinder condensation we have the prime cause for the improved economy possible by the use of compound engines. This is presented in order that the intending purchaser may be informed as to the reason why compound engines afford more economical service. The work done by them is also compared with the best single-cylinder performances. We make the following selections from the very clear and comprehensive statements presented :

The comparatively small amount of fuel—about 1 per cent.—that is required to raise the pressure and consequent temperature of steam, from the heretofore common practice of 80 pounds to 100 or 125 pounds, causes the power contributed by the added pressure to be produced at greatly reduced cost—or what is the same, reduced average cost per pound of pressure. Considered abstractly, this means a saving of a considerable percentage of the fuel bill for a given amount of power, but for reasons elaborated elsewhere, the development of power from steam at high pressure must be effected by an increased number of expansions, in multiple cylinder engines, if we would realize to the fullest extent the fuel gains incident to high pressures. . . . The use of a condenser in connection with a compound engine is always recommended wherever the water for condensation can be obtained at a reasonable cost, since the added power thus gained is obtained at a trifling expenditure of money. . . . The measure of saving that may be expected by the use of multiple-cylinder engines, condensing or non-condensing, over single-cylinder service, under like conditions, and assuming equally good constructions, may be roughly stated as from 10 to 40 per cent., varying with conditions, management, &c., so that even though the first cost of the plant will of necessity be somewhat more per horse-power, this larger investment will generally be a more judicious one in view of the resulting economies. . . . This highest economy is obtained in situations where the load of the engine being uniform (like that of a water-works pumping engine, or an ocean steamship), the design may be made to fit the situation exactly, and where the expansion may be carried to a greater extreme than can be done in an engine of moderate cost. . . . Uniform load, extreme ratios of expansion, great care to avoid leakage, through covering of pipes and cylinders to prevent radiation, and large areas of passage of steam to and from cylinders ; all have great influence in fixing the possible economy of the engine, but to gain the best results, expert management of both engines and boilers must be added. . . . Concerning steam jackets, the catalogue says : The utility of steam jackets or the extent to which they are useful has been the subject of a good deal of discussion among engineers. It is generally agreed, however, that the greater the number of revolutions per minute of an engine, the less the useful effect from the steam jacket ; for the shorter the time which is required to make a stroke, the less the amount of heat transmitted through the walls of the cylinder in that time. Moreover, the smaller the ratio of expansion which occurs in any cylinder, the less the amount of condensation in that cylinder during a stroke, and, therefore, the less the necessity of reducing that condensation by means of the steam jacket. . . .

We find the following remarks on the secondary advantages of compounding: High boiler pressures are becoming more common each year. When applied to simple engines these high pressures acting on valves, piston rings, &c., make it somewhat more difficult to lubricate effectively the wearing surface of these parts, and it may be stated without argument that the greater the difference between initial and exhaust pressures in any cylinder, the greater the difficulties which may be encountered in the way of effective lubrication. The reduction in ranges of pressures which occurs in a compound engine is highly beneficial in regard to this matter of lubrication, so much so that, regardless of the economy to be derived from compounding, when using high pressures, the increased ease of running which is secured is, in our experience, a matter of such importance that we consider it a second powerful reason in favor of this form of engine. It should be carefully noted that this

refers to engines using high steam pressures, or having a wide range between initial and exhaust pressures.

WE HAVE RECEIVED from Nicols & Dean of St. Paul, Minn., a catalogue describing and illustrating their Cyclone Emery Grinding Machine. This is so constructed that all parts of the various plow shapes can be readily brought to the emery wheel, and it is to do this work that this machine has been designed. It has a solid base 18 inches in diameter; the whole hight is 34 inches; the shaft 1¾ inches in diameter and 42 inches long; the babbitted bearings are 6 inches long, and the total weight is 205 pounds.

JAMES LEFFEL & CO. of Springfield, Ohio, the well-known builders of the Leffel Turbine Water Wheel, have just issued a new catalogue describing the machines built by them, illustrating some of the work they are especially intended to perform, and presenting, as has been customary for so long a time with this firm, much interesting and valuable matter concerning water power and the best means of utilizing it. Turbine wheels of the latest construction are described.

FROM L. S. GRAVES & SON of Rochester, N. Y., manufacturers of screw, hand and hydraulic freight and passenger elevators, we have a very handsomely gotten up catalogue and several pamphlets describing and illustrating all the many styles of elevators made by them. The elevators described are intended for almost every conceivable service, and are adapted to be operated under different conditions. What we might term the general installment of an elevator system in all its widely varying aspects is so fully described that the individual contemplating the introduction of such a system can find no difficulty in fitting the machinery to the power he has at hand and to the work he desires to do.

RIBON & MARCH of Jersey City, N. J., describe their patent dumping cars for mines, contractors, railroad construction, &c. The swivel cars are 2 feet gauge and 15 cubic feet capacity (equal to 1 ton quartz); the body or box is 39 x 41 inches, and stands 42 inches high on the track; total weight about 875 pounds. The side dumpers have the same capacity as the swivel, but stand only 38 inches high on the track, and weigh about 800 pounds complete. The cars are made entirely of iron, or greater part of steel, as may be desired.

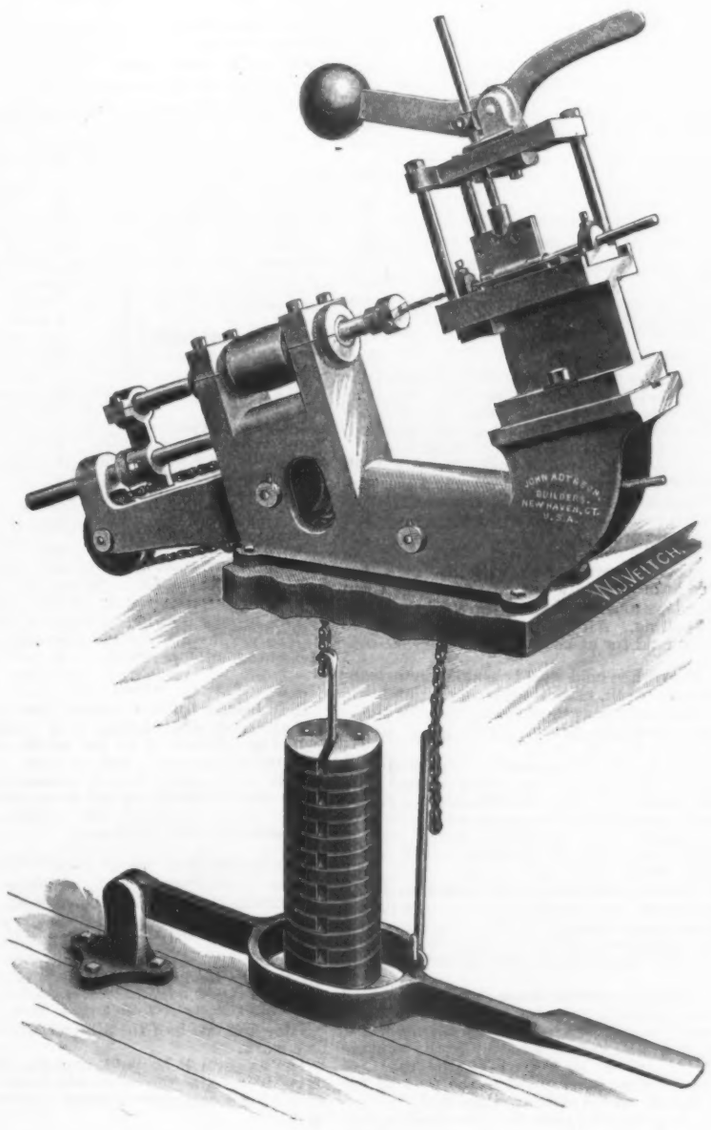
THE HUYETT & SMITH MFG. CO. of Detroit, Mich., have issued a book describing their method of heating and ventilating plants of every description, and for which they furnish everything from the boilers to the least fixture necessary to complete the entire plant ready for operation. The apparatus is also applicable to the drying of all kinds of material. The book describes and by many examples illustrates the construction of the Smith Hot Blast apparatus, and shows its many applications and advantages

THE PECH MFG. COMPANY of Leeds, Iowa, have added to their line of manufacture the well-known Nichols Centennial windmill, all the patents covering which they control.

FROM W. P. DAVIS of Rochester, N. Y., we have received a large sheet illustrating the many tools built by him. These consist in part of milling machines, key seaters, cutting-off machines, iron planers, drill presses, gear cutters, engines, boilers, hoisting machines, &c.

HENION & HUBBELL of 55 North Clinton street, Chicago, have issued circulars descriptive of their Torrent two-cylinder tank pump, which is stated to be an ideal thresher tank pump It is intended to be placed on the thresher wagon tank, where it occupies a space of but 9 x 16 inches. It can readily be disconnected and used for other purposes if desired. A second circular describes the Frost independent steam pumps for either hot or cold water, which are built with or without hand-pumping attachment.

DEAN BROTHERS STEAM PUMP WORKS of Indianapolis, Ind., describe all of the many styles of pumps made by them. These works are confined entirely to manufacturing steam pumping machinery. Among the pumps made we notice boiler-feed pumps, double-plunger pumps, single and duplex fire pumps, blowing engines, quarry pumps, power and electric pumps, elevator pumps, air compressors, &c.



BUTT-DRILLING MACHINE.

Butt-Drilling Machine.

The accompanying engraving represents a new butt drilling machine just brought out by John Adt & Son, New Haven, Conn., for the use of manufacturers of hardware, and especially those interested in the manufacture of cast door butts, as it is simple in construction and easily operated, besides being capable of doing as much work as the more expensive machines. It is so constructed that any number desired may be fastened side by side to the top of a bench and all run from one overhead shaft, there being but one belt running to each machine. The drill spindle runs at a sufficient angle to prevent the drill from becoming clogged by chips, yet the angle is not steep enough to allow the chips to get into the bearings, this being a serious objection to most machines having vertical spindles. The feed is operated by a series of weights, as shown in the illustration, and is so arranged that, as the drill is about to break through the work, the strain of the feed is taken off by means of a short coiled spring, thus preventing the drill from breaking through suddenly and becoming caught, and possibly broken. There is a very fine adjustment provided to make up for the wear of the drill and also adapting it for drilling butts of different lengths, as well as various other articles of a similar nature.

After the work is drilled the spindle may be drawn back by a pressure of the foot on the treadle shown under the machine, the work taken out and another piece put in, when the spindle can again be started toward the work by slowly raising the foot from the treadle until the drill strikes the work; the operator is then at liberty to attend to other machines, and one boy should be able to keep from 10 to 12 machines running. The machine is provided with an adjustable jaw or chuck for holding the butt while being drilled, the same being operated by a hand lever, shown in the cut at the top of the machine. The machine is capable of drilling a ¼-inch hole in common cast iron door butts at the rate of 1¼ inches per minute. Each machine is fitted with a suitable drill chuck and one long twist drill.

The London correspondent of the New York *Times*, alluding to the harvest failure in Russia and to the heavy loan just obtained in Paris for the building of railroads of a strategical character on the frontier, predicts "widespread ruin and commercial collapse" within another month, and adds that "there were last week ten failures of big Russian firms in St. Petersburg alone, with an excess of liabilities over assets of 8,000,000 rubles. The names of the firms are furnished to me, but they would convey no information to American readers. In each case the bankruptcy is ascribed to the bad harvest and the trade demoralization caused by the expulsion of the Jews."

WAGES IN STEEL MILLS.—I.

The Amalgamated Association of Iron and Steel Workers has just issued the official scales of prices which govern wages in the rolling mills making steel by the Bessemer, Clapp Griffiths and open-hearth processes. These scales of prices, while in a general way they are very similar, are adjusted to meet the peculiarities of each individual mill, and are of interest as dealing with concerns making widely different ranges of product. They include, of course, only the union mills, and do not deal with the far larger number of works throughout the country operating under scales adjusted between the employees and the works privately. It will be observed that the list includes the Columbia Iron and Steel Company of Uniontown, Pa., whose chief business is the manufacture of structural steel; Shoenberger & Co. of Pittsburgh, manufacturers of plates; Jones & Laughlins, Limited, of Pittsburgh, producers of structural steel and billets; the Bellaire Nail Works of Bellaire, Ohio, manufacturers of billets and nails, and the Junction Iron and Steel Company of Mingo Junction, Ohio, and the Belleville Steel Company of Belleville, Ill., who practically do the same line of business. There is presented also a scale of prices for the Clapp-Griffith plant of the Oliver Iron and Steel Company, and for the open-hearth plants of the Linden Steel Company, Jennings Brothers & Co., Apollo Iron and Steel Company, Moorhead, McCleane & Co., and Kirkpatrick & Co., Limited, all within the Pittsburgh district.

BESSEMER.

Columbia Iron and Steel Company, Uniontown, Pa.

CONVERTING DEPARTMENT.

Position.	Number employed.	Rate, per 100 tons, 2240 lbs.
Metal wheelers, each	6	$1.97
Coke wheelers, each	2	1.81
Cupola foreman	1	3.81
Cupola helper	1	2.33
Cupola cinder tapper	1	1.87
Cupola cinder snappers, each	2	1.87
Ferromaganese man	1	2.00
Vesselman	1	3.74
Vesselman's helper	1	2.50
Vesselman's cindermen, each	3	2.27
Steel pourer	1	3.74
Pitmen, each	7	2.98
Mold sander	1	2.98
Stopper setter	1	2.84
Stopper carrier	1	2.80
Vessel regulator	1	2.50
Crane regulators, each	2	2.50
Ladle liner	1	2.80
Ladle liner's helper	1	2.32
First pusher	1	1.72
Second pusher	1	1.68
Vessel scraper	1	1.78
Bottom maker	1	2.50
Bottom maker's helper	1	2.00
		Per day.
Stopper maker	1	2.50
Grinding panman	1	2.50
Grinding panman's helper	1	1.80
Cranemen, each	2	1.50
Engineer blowing engine	1	2.75
Engineer's blowing engine helper	1	2.25
Cast pit cleaner	1	1 80

It is further agreed:

1. That the above scale of wages shall be paid at 2240 pounds per ton on all perfect ingots as produced in the converting pit, except such ingots and pieces as require to be cut up and remelted in the cupola or vessels.

2. That the cupola foreman and two helpers shall each receive 100 tons allowance, at the list prices, for work of fixing cupolas when same is done off their regular turn; this fixing day to be limited to 12 hours.

3. That the vessel foreman and helper shall receive 100 tons allowance, at their list prices, for fixing vessel when same is done off their regular turn; this fixing day to be limited to 12 hours.

4. That in case a stop is made longer than 24 hours, the company shall be at liberty to employ such help on repairs as may be available, preference being given, as far as possible, to the men at the converting department, at current laboring wages.

5. That additional help at helper's rates shall be employed at bottom making whenever in the judgment of the foreman of the department more than nine bottoms shall be required in any one week.

6. That in case of slow running, from any cause whatever, not less than 80 tons shall be paid for, provided the men remain on duty until 5 o'clock, and after 5, 100 tons.

7. That the coke wheelers shall put up all coke required for Monday's cupolas at the close of the previous week's work, and if additional cupola is to be started during any regular turn, the coke wheelers to put up all the coke required to light it.

Columbia Iron and Steel Company, Uniontown, Pa.

BLOOMING DEPARTMENT.

Position.	Number employed.	Rate per 100 tons, 2240 lbs.
Roller screwman	1	$4.84
Rougher	1	3.63
Hooker	1	2.75
Manipulatorman	1	2.75
Engineer reversing engine	1	3.25
Shearman	1	3.63
Shear helper	1	2.75
Shear tongsmen, each	2	2.44
Shear drag out	1	2.44
Shear hooker	1	2.44
Butt wheeler	1	2.44
Heater, soaking pit on hot steel	1	4.84
Bottom makers, soaking pit on hot steel	2	3.00
Chargers and drawers, soaking pit on hot steel	3	2.44
		Per ton.
Heater, soaking pit on cold steel	1	$0.39
Bottom makers, soaking pit on cold steel	2	.15
Chargers and drawers, soaking pit on cold steel	3	.15
		Per day.
Wiper and greaser engine and mill	1	$1.90

When in the judgment of the manager additional tongsmen are required the same shall be provided at tongsmen's rate.

It is further agreed:

1. That the tonnage weights to be paid for shall be taken as weighed at shear scales at 2240 pounds per ton on all perfect and finished shapes, blooms, billets and slabs, rolled to standard sizes and as recorded at the shear scales.

2. That when hot and cold steel are both heated in any furnace or pit on one turn, separate weights of each shall be kept and the furnacemen paid for the actual tonnage of each at the scale prices.

3. That the company are at liberty to make any special arrangement with the men employed at or about the furnace to charge them on Sundays and to bring up the steel for Monday's rolling. All cold steel so brought up shall be paid for at hot steel rates, actual tonnage.

4. That when cold steel is heated exclusively during the week, after the Sunday night heats have been withdrawn, payment is to be made for actual weight heated, as recorded at the shears at cold steel prices.

5. That for a roll change the roller, rougher, hooker, manipulator man, shear helper and shear hooker shall be allowed actual tonnage and 50 tons at the scale prices, except when the roll changes are on Sundays or days when the mill is not on, when the allowance shall be 100 tons at scale prices.

6. That in case of a break down in either department, in the machinery or fixtures, causing a suspension of work for the remainder of the turn, the tonnage actually made up to the time of the break down shall only be paid for.

7. That if a break down should occur and the men are held by order of the foreman for any part of a turn, expecting to resume work, they shall be paid in addition to the tonnage made by them such part of the rate for 80 tons, as shall correspond to the part of the turn during which they are thus held.

8. That not less than 80 tons shall be paid for, provided the men are held until 5 o'clock, and after 5, 100 tons.

9. That the men shall be allowed to finish their turn, provided there is sufficient steel on the ground over what is required to charge the soaking pit.

10. That actual tonnage shall be paid for Saturday's work only.

11. That one spell hand be allowed at the blooming mill during the months of June, July and August, when running on hot steel.

Columbia Iron and Steel Company, Uniontown, Pa.

TWENTY-SIX INCH STRUCTURAL MILL.

Position.		Number employed.	Rate per ton, 2240 lbs.
Roller	On output of mill.	1	$0.25
Sticker-in		1	.09
Rougher-down		1	.16
Catcher		1	.23
Rougher-up		1	.15
First hook		1	.09¼
Second hook		1	.08¾
Third hook		1	.08¾
Fourth hook, each		2	.08¾
Straightener, "cooling bed," each		5	.08¾
Heater	On output of one furnace.	1	.41
Heater's first helper		1	.20
Heater's second helper		1	.16
Charges and drawers, each		2	.14
Buggyman (on output of mill)		1	.09
Sawyer (on output of mill)		1	.08¾

NOTE.

It is hereby further agreed that the roller and all roll hands shall change rolls whenever required, at the rate of $1.50 per man per set of rolls, and keep the mill in good running order.

The following shall be the scale of prices for the undernoted occupations:

Position.	Number employed.	Rate per hour.
Straighteners on cold presses	1	$0 22½
Straighteners' helpers, each	2	17½
Markers for cold saws	1	.20
Feeders for cold saws	..	.20
Helpers on cold saws	..	.15
Millwrights	..	.27½
Punchers	..	.20
Punchers' helpers	..	.15
Chippers	..	.16

Columbia Iron and Steel Company, Uniontown, Pa.

EIGHTEEN-INCH STRUCTURAL MILL.

Position.		Number Employed.	Rate per ton, 2,240 lbs.
Roller (on output of mill)	On output of one furnace.	1	$0.70
Heater No. 1 furnace		1	.70
First helper No. 1 furnace		1	.14
Chargers and drawers, each		2	.12
Heater No. 2 furnace		1	.70
First helper No. 2 furnace		1	.14
Chargers and drawers, each		2	.12
Catcher	On output of mill.	1	.43¾
Rougher-down		1	21
Rougher-up		1	.18¾
Sticker-in		1	.18
Point-in hook front		1	.13
Point-in hook second		1	.12½
Run-out front hook		1	.12
Point-in hook back		1	.13
Point-in hook second		1	.12½
Run-out hook back		1	.12
Buggyman		1	.12½
Straighteners on hot bed, each		4	.12½
Sawyer		1	.12½
			Per day.
Engineer		1	$2.35
			Per hour.
Straighteners on cold presses		1	$0.23½
Straighteners' helpers, e'ch		4	.17½

NOTE.

It is hereby further agreed that the roller and all hands shall change rolls whenever required at the rate of $1 per set per man and keep the mill in good running order.

It is also hereby further agreed that the roller pay the sticker-in and rougher-down out of his wages, and that the catcher pay the rougher-up out of his wages.

MISCELLANEOUS SCALE OF WAGES FOR 1891-92.

	Per day.	Hours.
Pipe fitter, day	$2.75	10
Pipe fitter, night	2.75	12
Pipe fitter's helper	2.00	12
Millwright	2.75	10
Millwright's helper	1 80	10
First water tender	2.25	12
Second water tender	2.10	12
General greasers	2.00	12

Time and one-half for all overtime and Sunday work.

The wages will be paid semi-monthly, paydays being on the 10th and 25th of each month, the company always retaining two weeks.

Shoenberger & Co., Pittsburgh, Pa.

CONVERTING MILL.

Position.	Number employed.	Rate, per 100 tons, 2240 lbs.
Metal wheelers, each	5	$2.68
Coke wheeler	1	1.91
Cupola foreman	1	3.81
Cupola foreman's helper	1	2.50
Cinder snappers, each	2	1.87
Ferromanganese	1	2.50
Vesselman	1	3.74
Vesselman's helper	1	2.50
Vesselman's cindermen, each	3	2.27
Scrappers, each	3	1.73
Steel pourer	1	3.74
Pitmen, each	5	2.98
Stopper setter	1	2.84
Stopper carrier	1	2.84
First regulators, each	2	2 83
Second regulators, each	2	1.73
Ladle liner	1	2.80
Ladle liner's helper	1	2.80
Stopper maker, total tonnage	1	1.05
Bottom maker	1	2.57
Bottom maker's helper	1	2.16

NOTE.

1. That the weights shall be taken at 2240 pounds per ton on all ingots taken from cast-

ing pit, except such pieces as must be remelted in the cupolas or vessels.

2. That the cupola foreman and one man shall receive 100 tons allowance for work of fixing cupolas, when done off their regular turn; this fixing day to be limited to eight hours. The cupola shall be fixed when ready on the regular turn from April 1 to October 1, and from October 1 to April 1 the work shall be done on the day following the stop or when ordered by the superintendent. The last sentence to apply while only two cupolas are used in regular practice.

3. That the vessel foreman and helpers shall receive 100 tons for fixing vessels, when done off their regular turn; this fixing day to be limited to twelve hours.

4. That in case a stop is made longer than 24 hours, we shall be at liberty to employ such help on repairs as may be available at current laboring rates, preference being given to the men of the converting department as far as possible.

5. That additional help at helpers' rate shall be employed on bottom making, whenever in the judgment of the foreman of the department it is necessary.

6. For groups all men to get one and one-half weight, excepting the five pitmen, two regulators and one stopper carrier, who are to get double weight.

7. Stopper carrier to put up group bottoms and center runners and stooper maker to have the pricks on hand for the same.

8. It is further agreed that in case of a mechanical breakdown in the operation of the plant, and foreman requires the men to stay, pending repairs, the men shall receive 100 tons for that turn.

9. When the "direct process" is in full operation and results in the stoppage of the cupolas, the metal and coke wheelers, cupola foreman, cupola helper and cinder snappers are to be dispensed with.

10. In case of using hot metal from the blast furnaces and metal from the cupola on the same turn, the cupola foreman, cupola helper, metal and coke wheelers and cinder snappers are to be paid for 100 tons for each turn, or as much more as they produce, and the second cinder snapper is to help vessel cinderman.

11. When the third cupola is started running in regular practice, instead of five metal wheelers at $2.63 and one coke wheeler at $1.91 per 100 tons, there are to be six metal wheelers at $2 11 and two coke wheelers at $1.81 per 100 tons.

12. When cinder boxes are provided for the cupola cinder, the cinder snappers are to be dispensed with.

13. On Saturdays charging is to cease at 12 noon.

Shoenberger & Co., Pittsburgh, Pa.

BLOOMING MILL.

Position.	Number employed.	Rate per 100 tons, 2240 lbs.
Heater, he to pay one helper	1	$9 63
First helper, paid by the company	1	3.15
Second helpers, each	2	2.80
Third helper	1	2.60
Buggyman	1	2.44
Roller	1	4.84
Rougher	1	3.63
Hooker	1	2.75
Shearman	1	3.63
Shearman's helper	1	2 60
Forkman	1	2.60
Fork-pull	1	2.44
Straightener	1	2.44
Table runner	1	2.44
Engineer	1	3.00

It is understood:

1. That the weight shall be taken as recorded at the bloom shear scales, at 2240 pounds per ton, for all merchantable steel rolled at blooming mill.

2. That in case of a breakdown in either department in the machinery or fixtures, causing a suspension of work for the remainder of the turn, the tonnage actually made up to the time of breakdown shall be paid for.

3. In case of a mechanical breakage in the operation of the plant and the foreman requires the men to stay, pending repairs, the men shall receive 100 tons for that turn.

4. That the company take cinder taps away from furnace.

5. That the company will furnish pull-up.

6. The company will furnish oiler and greaser for blooming department.

7. It is understood that if billets less than 4 x 4 are made on blooming mill, special prices shall be made for those sizes.

Shoenberger & Co., Pittsburgh, Pa.

OPEN-HEARTH DEPARTMNT.

Position.		Number employed.	Rate per turn.
Melter	Rates for 1 furnace	1	$5.00
First helper		1	2.75
Second helper		1	1.88
Chargers, each		2	1 88
Pitman		1	2.00
Pitman's helper		1	1.55
Ladleman		1	2.19
Craneman		1	1.88
Bottom maker, both turns		1	1.88
Gas maker		1	2.30
Melters, each	Rates for 2 furnaces.	2	5.00
First helper		1	3.35
Second helpers, each		2	2.25
Chargers, each		4	2. 0
Pitman		1	2.31
Pit helper, first		1	1.70
Pit helper, second		1	1.50
Ladleman		1	2 31
Ladleman's helper		1	1.50
Bottom maker, both turns		1	2.10
Bottom maker's helper, both turns		1	1.50
Craneman		1	2.10
Gas maker		1	2.30

It is understood:

1. That 13 heats shall constitute a week's work on any grade of steel; if more than 13 are made the above prices shall be paid pro rata.

2. The company shall provide a pull-up for each turn.

3. For cutting out tap hole and making bottom on Sunday one second helper and two chargers shall receive one fourth turn each.

4. That 24 heats shall constitute a week's work on two furnaces.

5. When one furnace is melting and the other getting ready the first helper shall receive the two-furnace rate and be paid for extra heats made on one furnace; two-furnace rate to begin from the time gas is put in ports of a new furnace.

6. Ladlemen and helper shall each receive one-half turn for lining up ladle on Sunday.

7. Second and third clauses on one furnace will also apply to two furnaces.

Shoenberger & Co., Pittsburgh, Pa.

ONE HUNDRED AND TWELVE INCH PLATE MILL.

Position.	Number employed.	Rate per day.
Heater	1	$6 96
First helpers, each	2	2.53
Second helpers, each	2	2.20
Third helper	1	1.90
Buggyman	1	1.70½
Pull-up	1	.71½
Screwman	1	3.30
Hookers, each	3	2.08
Tableman	1	2.75
Sweepers, each	3	1.70½
Shearing, straight, per ton of 2240 pounds		.28½
Shearing, heads, per ton of 2240 pounds		.33½
Engineer, big engine, per day of 12 hours		2.50

It is understood:

1. Four heats shall constitute a day's work. When five heats are made out of two furnaces the additional heat shall be paid for pro rata.

2. That when by breakdown or any other cause charging crew are required to pull heat, or heats, regular prices shall be paid.

3. The firm will change middle roll.

An admirable lengthy report has just been published in Germany by Prof. R. Krohn, chief engineer of the Gutehoffnungs Huette of Sterkrade. It embodies the results of a series of investigation carried out by the works in question in conjunction with the State railroad officers of the district in question. The object was to ascertain the most suitable material for bridge construction, contrasting wrought iron piled from scrap, muck iron and high and low carbon basic steel. The tests were carried out both on test pieces and on finished members riveted, and considerable attention was also paid to the effect of punching and drilling. Professor Krohn places on record at the same time the results of experiments made to ascertain the effect of blue heat. His results clearly show that that dreaded temperature is less injurious to both iron and steel when it is reached by cooling from red heat than it is by obtaining it by heating from the ordinary temperature. All the tests in question agree in indicating that the most suitable material for bridge purposes is the milder basic open-hearth steel with a tensile strength of 34 to 27 kg. to the square millimeter. Experiments were also made to reach some data as to the effect of overheating and of cold rolling.

Labor Labels Void.

A sweeping decision, not only against trades union ownership of trade-marks, but emphatically against their employing the same to stigmatize or injure non union competitors, was handed down by Judge Williams and concurred in by the other Supreme Court Judges, in a case just decided at Pittsburgh. It is of national interest and import.

Cigarmakers' International Union, No. 126, of Ephrata, Lancaster County, by bill in equity restrained cigar manufacturer John H. Brendle from using the Cigarmakers' International Union label on his goods. Lancaster's County Court sustained the Master's report in behalf of this injunction. Brendle, a union manufacturer, who had in some manner incurred the local union officials' ill will and refusal to use their labels, issued similar labels or trade-marks of his own, and appealed to the Supreme Court from the injunction.

Judge Williams, in refusing for the Supreme Court to grant this injunction or affirm it, reverses the lower Court's decision, first, on the ground that the Cigarmakers' Union, formed for the "mental moral and physical welfare of its members," is a personal and social organization, not a commercial one, and so under the law of Congress cannot own a trade-mark.

But the universally interesting feature of the decision is its discussion of the social claim set forth in terms upon the union cigar label, to the exclusive right not only to the use thereof, but stigmatizing all workmen not permitted to use the trade mark. The label describes the cigars it accompanies as being "made by first-class workmen," adds that all cigars not having the label are of "inferior, rat-shop, cooley, prison or filthy tenement house workmanship," and has a note, therefore, "recommending these union cigars to all smokers throughout the world."

Judge Williams' decision says: "This is an attempt to use the public as a means of coercion, in order to find a market for their goods or labor. . . . A first-class workman is one who does first-class work, whether his name is on the rolls of any given society or not. Filthiness and criminality of character depend on conduct, not on membership of the union. Legitimate competition rests on superiority of workmanship and business methods, not on the use of vulgar epithets and personal denunciation.

"The International Union in this case has an avowed purpose to do harm to non-union men, to prevent the sale of their work, to cover them with opprobrium; and they ask a Court of Equity to say that they have a right to do it. We decline to say so.

The Michigan Mining School, at Houghton, which has developed rapidly under the management of Dr. M. E. Wadsworth, has just issued its annual report and catalogue, which testify to the good work done and to the ambitious plans of this comparatively young institute of learning.

The Iowa Iron Works of Dubuque, Iowa, have completed the construction of the Government steel snag boat James B. McPherson. The trial trip was made on the 17th inst., an invitation to which is acknowledged on behalf of our Chicago office.

The Boston Fire Tests.

A practical exhibition and test of various fire proofing materials was made in Boston on October 15 in a building constructed for the purpose in a vacant lot on New Park street formerly used for a base-ball ground, the seats providing convenient accommodations for nearly 500 spectators, comprising builders, underwriters, officers of the fire department and architects. The building was built of 2 inch upright plank, covered with a flat tinned roof and divided by partitions into seven cells, each about 5 x 15 feet and lined with fire-proof materials, as shown in the illustration. The building was erected jointly by the following manufacturers of the materials used: The King's Windsor Cement Dry Mortar Company, New York Eastern Plaster Board Company (cellular blocks of plaster of paris with rushes laid in the plaster), the Magneso-Calcite Fire-Proof Company (a fire-proof paper), the Boston Fire-Proofing Company (porous terra cotta lumber), the Clinton Wire Cloth Company, the New Jersey Wire Cloth Company, the albamural made by Stark, Edson & Co. (a fire resisting plaster finish). Common lime plaster and wood laths were also used.

The entrance to each cell at the front was provided with a fire door tinned on one side and the edges, which is not the standard fire door, although frequently used in the practice, where it is considered that the exposure is only on one side. There was a scuttle about 2 feet square in the roof over each cell. The four openings in the partitions of the first four cells were also fitted with tinned fire doors, three of which were lined with fire-proof papers under the tin. On each side of the passage between cells four and five were tinned fire shutters, one of them being lined with magneso-calcite paper under the tin. Four links were hung in each cell, which were composed of materials melting at the following temperatures, F.: Lead, 626°; antimony, 842°; aluminum alloy, 1292°; brass, 1850°.

The following persons were requested to act as a committee to supervise the experiments: C. J. H. Woodbury, vice-president Boston Manufacturers' Mutual Fire Insurance Company; C. H. Goddard, secretary New England Insurance Exchange; D. S. Lord, Superintendent of Buildings, and Charles H. Rutan of Shepley, Rutan & Coolidge, architects.

About a quarter of a cord of kiln-dried hickory wood was placed in each cell, and half a cord in the passage between the buildings, with a small quantity of small wood and kerosene oil to serve for kindling the fires, which were lighted at 12.20 p.m. The flames burned fiercely and the heat was so intense that one would not wish to remain within 50 feet of the building, but the structure resisted the heat so well that it was not on fire for about an hour, although the fire doors at the front had fallen before this time from the charring of the wood at the hinges, caused by the heat following the screws so that they would not hold. Three of the links in the cells had melted by this time, showing the temperature to have exceeded 1292°, and later it was found that all the links had melted except the brass link (1850°) in cell No. 7.

The generation of gas from the wood used in the construction of the tinned fire doors was quite noticeable throughout the test, and at an early stage in the fire one person of an inquisitive mind, noticing the gas issuing from the seams in the tin, lighted it with a match, and thus it burned for some minutes. One of the interior fire doors, covered with tin-lined asbestos paper, was swelled up by the gas pressure to a thickness of nearly 1 foot, resembling in its outlines a distended rubber pillow.

DIAGRAM OF BUILDING ERECTED FOR THE BOSTON FIRE TESTS.

Various observations were made by the spectators at different stages in the fire, but it was impossible to make any careful examination until the fire had been extinguished by the members of the Boston Fire Department, who used a hose stream very carefully at 2 o'clock, or 1 hour and 40 minutes after the fire had been started.

An examination of the building after the fire was extinguished showed that in cell No. 1 the King's Windsor cement laid on wood lath was off, and that the plastering had fallen by reason of the charring of the wood at the back. The lime and hair mortar laid on the plaster board on the left-hand side was intact, as was also the King's Windsor cement on the opposite side of this plaster board partition on the right-hand wall of No. 2. The King's Windsor cement laid on the porous terra cotta lumber on the left-hand side of cell No. 2 was intact. In cell No. 3 the King's Windsor cement on the porous terra cotta lumber was in good shape, but the same material laid against the plank wall on the left-hand side had fallen. Cell No. 4 was lined with King's Windsor cement laid upon wire lath. The bond of the cement to the wire lath was so strong that it held in place very well, although the plank wall had been burned so that nearly all the support was removed.

The passageway between the buildings showed the effects of severe heat, as both sides had been destroyed by the flames, reducing the wood to charcoal, and they had afterward fallen down. In No. 5 the walls were covered with King's Windsor cement on wooden laths. These laths had been charred, allowing some of the cement to fall on both sides. Cell No. 6 was quite similar, with the exception that two thicknesses of magneso-calcite were placed against the planking before the lathing was applied, and in some cases the heat had been so great as to entirely remove the wood, leaving the magneso-calcite still on the partition. The last cell, No. 7, was lined with wire cloth covered with lime and hair mortar on the right-hand side and King's Windsor cement on the left-hand side. As far as the melting of the brass links are an indication of the heat, this cell was not exposed to so high a temperature as the others, as it was the only one in which the brass link did not melt, although the heat was such as would be called intense in the course of an ordinary fire. The interior of this cell was in very good order and not severely injured by the fire.

The result of all the experiments was very interesting and instructive, not merely showing the high resistance of the cement and other materials to heat, but also the stability of partitions and walls of 2-inch plank when exposed for a long time to the heat of a very serious fire.

Some question has been raised as to the assessment of duty on the Transactions of the Iron and Steel Institute of Great Britain. We are informed officially that in the absence of a specific provision of law exempting the publications of societies from payment of duty when imported by members of such societies, they are properly liable to duty at the rate of 25 per cent. *ad valorem* under the provision in paragraph 423 of the act of October 1, 1890, imposing that rate of duty on books.

President Harrison on Saturday, at the Washington Navy Yard, witnessed the hydraulic mounting of one of the 12 inch guns intended for the Monterey and the largest gun ever made for the United States Navy. He also inspected the new hot-blast furnace for heating jackets and hoops, which is being constructed in the shrinking pit of the gun shop.

Tests and Requirements of Structural Wrought Iron and Steel.*

BY ALFRED E. HUNT, PITTSBURGH, PA.

This paper is suggested by the appointment on the part of the American Societies of Mechanical and of Civil Engineers of committees upon the subjects of "Standard Tests and Methods of Testing" and "Uniform Methods of Tests of Material Used in Metallic Structures," respectively, and by a study of the reports, appendices, and statements proceeding from these committees. Moreover, the writer has had frequent occasion to hear the complaints of manufacturers who furnish structural material subject to specifications that in the tests prescribed, the number of tests required, and the methods of making them and interpreting their results, engineers of design, who for the most part draw the specifications, do not sufficiently avail themselves of the experience of "the practical mill men," and are not themselves sufficiently acquainted by experience with the details of the work to frame intelligently their requirements of the structural material that they order.

Most structural iron and steel is ordered from the mills by the bridge maker, boiler manufacturer or other contractor, with whom the engineer only comes in actual business contact; and often between the engineer and the mill manager another middle man, "the commission agent," intervenes. The inspector under such contracts not infrequently hears the engineers who are the authors of specifications talked about as "mystical," "tyrranical," "impracticable" or "insatiable in their ever more and more rigid requirements," and as clothed with unjust power over the business rights of the manufacturers of structural material.

Such animadversions are injurious and sometimes dangerous to both interests involved. They may lead to a lowering of standards of integrity among subordinates who have direct charge of the work of manufacture, tests, and shipments of material. These subordinates sometimes gather from such incautious statements the notion that it is "smart" and for the interest of their employers and themselves to deceive the inspectors, and to ship material that will not answer the specifications, in the place of that which the manufacturer has honestly agreed to furnish. It need not be argued that such a course will bring upon iron and steel manufacturing concerns, no matter how large or powerful, disaster measured by the failure of the structures to which their defective material may have contributed, and that decisive steps must be taken to eradicate both the fault and its cause.

On the other hand, by reason of the sharp competition and the difficulties of concerted action among manufacturers there is often little scanning of the demands for tests and their requirements until after the contracts have been closed, and then the engineer, upon being appealed to for modifications, often looks upon such efforts very properly as attempts to lower the actual quality, and probably the cost, of the material to be furnished, matters which he thinks should have been called to his attention before the acceptance of the contract, but not after.

The writer offers, from the standpoint of somewhat extended experience as an inspector of structural materials, some suggestions, directed to the following points:

1. *What Tests are Usually Made to Determine the Quality of Structural Material.*—Tensile tests, including the elastic limit and ultimate strength per square inch, as measures of the strength and tenacity, together with the percentage of elongation and reduction of area as measures of the ductility, are agreed upon by all as the best physical tests, all things considered, to determine the quality of structural wrought iron or steel. They are often necessarily expensive, owing to the cost of preparing test specimens by means of planers, slotters, milling machines, or lathe tools, from sections which may be either too large or too irregular to be pulled in full size. In the writer's judgment, cheaper and more quickly prepared tests can be advantageously used as a substitute for a part only of these more expensive tensile tests. They have also the advantage of affording check and corroborations, not likely to be subject to errors that might continuously occur with one method of testing.

The determination of the modulus of elasticity in connection with tensile tests adds much to the time, labor and skill required, and is now seldom required as a measure of the quality of the metal. It is used only as a special test in determining the applicability of varying materials which are to be used together in the same members of a structure. The other tests, commonly used in the best practice to-day, are outlined below.

Annealing tests of forged work, and of all material subject to subsequent annealing after test specimens have been taken, are now called for. That is, a series of tensile tests is required of specimens carefully annealed before being prepared for pulling in the testing machines; these tensile results to be compared with those of tests made upon specimens in their original condition. This seems to be an excellent provision, and the writer would suggest that, for tension bars, of low steel at least, a suitable number of annealed test specimens should be pulled in tension to ascertain the normal tensile strength, since a considerably higher strength may be imparted to steel by cold rolling, but will be lost in such a subsequent annealing as bridge members receive after the eye bars are made up. To determine the tensile strength which can be depended upon, therefore, the test bars should be pulled annealed as well as unannealed.

The drifting test, by striking with a sledge upon a steel drifting pin in punched holes, and noting the size to which these holes can be enlarged, under different circumstances, without fracture of the material, is a practical test that shows the actual behavior of the metal, and can be made upon scrap pieces without wasting merchantable stock, and without expensive machine-shop work upon the test specimens. The writer believes it should be one of the standard tests of wrought iron and steel plate and shapes. It presents the further advantage that exact data can be obtained for records regarding it, and when desired specimens themselves can be kept conveniently, stamped with the melt number and other identifying marks, as a record of the quality of the material. This test is not upon the list of standard tests proposed upon pages 514 and 515 of the "Report of the Committee on Standard Tests and Method of Testing" of the American Society of Mechanican Engineers.

The bending test for soft structural steel is, by itself, not a crucial test of quality. I have found many specimens that pulled in a testing machine very brittle and crystalline in fracture, yet under the bending test the bar would come over upon itself through an angle of 180° without fracture. Most steel of less than 68,000 pounds tensile strength and under ¾ inch thick will bend down double over itself if the specimens have planed edges and sound specimens are taken to start with. At the same time, the bending test is properly regarded by engineers as one of the important corroborative tests for both wrought iron and steel.

* Presented at the Glen Summit meeting of the American Institute of Mining Engineers.

The nicked bending test for wrought iron is believed to be important, and, in all inspection, it is regularly made and carefully recorded. The conditions, however, under which nicked bending tests are made have much to do with the results. These conditions should be made as nearly as possible uniform, in order that their interpretation may be facilitated. The temperature at which the nicked bending fracture is made is an important factor. At low temperatures, as has been proved, most irons appear more crystalline than they do under ordinary summer temperatures. It need hardly be remarked here that the nicked bending test is not applicable to steel except under special conditions, as in rivets.

For rivet rods, one of the best tests, it seems to me, is actually to rivet up some work with them, then cut the rivets out and see that they cut out tough and silky in the case of steel or fibrous in the case of iron. Rivet steel rods should not have over 60,000 pounds per square inch tensile strength, and should forge successfully at a red heat. When steel scrap is used with iron, in wrought-iron plates and shapes, the nicked bending test, nicking to various depths of the section before bending, is usually the best way of ascertaining the soundness of the welds, and may be recommended for frequent employment.

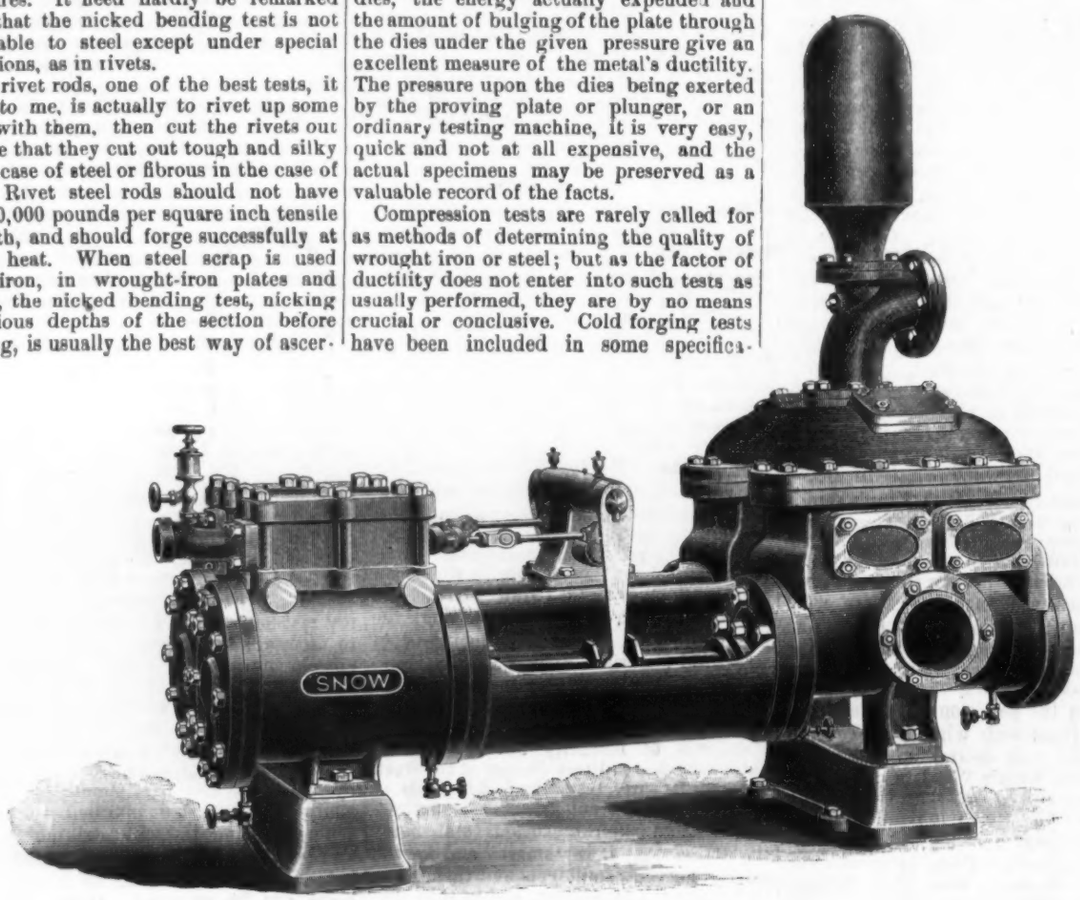
The hardening or quenching tests of low-carbon structural steels prescribed by the committee of the American Society of Mechanical Engineers (page 14 of the report) seem to the writer to be of doubtful utility, except when very carefully made, and upon steels likely to be subjected to similar treatment in actual practice, such as fire-box steel, some steel rivets, &c. In my experience, all steel, no matter how low in carbon, will harden more or less, as shown by tension tests in a testing machine; the amount depending upon not only the hardness in the steel, but also the temperature to which it is heated and the character of the solution into which it is plunged to quench it. Unless all these conditions be very carefully kept uniform the general experience is that conflicting results will be obtained from quenching tests.

In this connection it may be pointed out that the test prescribed in some specifications, that steel having a tensile strength in many cases of from 64,000 to 70,000 pounds per square inch, and in some cases of from 60,000 to 68,000 pounds, shall be capable in test speciments of bending double on itself after being heated to an intense red heat, or to a cherry red heat, and then plunged into water, is very unsatisfactory, because the temperature to which the specimen has to be heated is difficult to determine, and yet small differences in this temperature have much to do with the endurance of the steel under the test.

The bulging test recommended by Kirkaldy, thought not often used in this country, is a useful, practical measure of the ductility of the metal, and especially adaptable for testing of soft flange steel. A sheet somewhat larger than the diameter of the dies being pressed through the dies, the energy actually expended and the amount of bulging of the plate through the dies under the given pressure give an excellent measure of the metal's ductility. The pressure upon the dies being exerted by the proving plate or plunger, or an ordinary testing machine, it is very easy, quick and not at all expensive, and the actual specimens may be preserved as a valuable record of the facts.

Compression tests are rarely called for as methods of determining the quality of wrought iron or steel; but as the factor of ductility does not enter into such tests as usually performed, they are by no means crucial or conclusive. Cold forging tests have been included in some specifications, which have required that a bar ½ inch square be found capable of being forged down cold to a thin flat edge. Much depends on the skill of the smith who does the work; and as there are easy ways of evading the requirements of the specification, the test is seldom used, and the writer believes it is of doubtful utility. Hot-forging tests of metal to be used for special purposes, and as direct practical trials of the fitness of the metal for the work required of it, are often employed, and seldom objected to. The welding test is another practical trial of wrought iron generally confessed to be reasonable where the metal is destined to be welded in actual use.

Inevitable variations in the raw material, the process of manufacture and the amount and methods of manipulation from the pile, bloom or ingot to the finished material preclude the certainty of obtaining always the same tensile tests from the same chemical analysis. For example, a considerably higher percentage of carbon is required in the very low phosphorus boiler plate and other structural steel made by the basic process to-day to give the same tensile strength as that of similar metal made by the acid process. The same remark applies to open-hearth steel largely made from soft direct-made bloom iron, such as the product of the Carbon Iron Company of Pittsburgh, or from soft puddled blooms, as compared with the metal made from hard steel-scrap stock. Except where the larger deflection under transverse loads becomes a serious factor, the softer steel is better, and I believe it can be more safely trusted under higher unit strains than the metal with a greater strength and greater apparent factor of safety. In this particular the common engineering practice and reasoning seem to me erroneous, especially where the metal is to be heated and forged locally, as in eye bars, or where it is to be subject to alternate heating and perhaps sudden cooling, as in fire-box steel. In such cases steel below 64,000 pounds per square inch in tensile strength can be safely trusted with a higher unit strain than metal of higher ultimate strength obtained by running the carbon over 0.18 per cent.



THE SNOW STEAM PUMP.

As outlined above, there are reasons which may justify, under some circumstances, where high ultimate strength is required, the prescription of a carbon test with a maximum allowable limit. It should be said, also, that very soft steel, as ordinarily made by the open hearth or the Bessemer processes, becomes seamy, open or unsound if below 0.07 per cent. in carbon. Again, in some cases where the metal will be subjected to considerable forging a sulphur requirement, with a maximum of 0.04 per cent. for steel and 0.05 per cent. for wrought iron, is advisable. But under ordinary conditions this matter, as well as that of the other chemical constituents, with the exception of the phosphorus in steels, can be safely and most wisely left to the manufacturer's own judgment of his product and of the chemical formula that will (together with skillful manipulation in manufacture) give the required physical qualities. With regard to phosphorus, however, there is strong reason for specifying and limiting it in structional steel, for it has been found

that more than 0.10 per cent. of this element greatly increases the chances of failure under the physical tests, while steel containing less than 0.08 per cent. of phosphorus gives much more uniform results physically than higher-phosphorus metal. Since the percentage of phosphorus in the stock from which acid steel is made determines largely (in inverse proportion) its relative cost, the manufacturer is tempted to let the phosphorus run near the danger line, and often this economy is carried to a point that involves a positive loss, by reason of the increased amount of rejections thus occasioned. In order to put all parties upon an equal basis in bidding, as well as to secure a safeguard against cold-short metal, a maximum phosphorus limit is now almost universally made for steel, 0.10 per cent. being the most lenient, 0.08 per cent. the more rigid requirement for acid steel. For basic steel, it has been considered wise to determine the phosphorus in each melt in order to know that the basic slag has performed its function properly. Many engineers demand less than 0.05 per cent. in basic steel where they allow 0.08 per cent. in acid steel of less than 68,000 pounds per square inch tensile strength. The extra requirement is based upon the supposition that unless very high phosphorus manganese be added, or there be some improper treatment in the last stage of the heat, which restores a portion of the phosphorus to the metal, phosphorus ought to fall below 0.05 per cent. in properly made basic open-hearth or Bessemer steel.

A considerable number of specifications made within the past few years for bridge steel have discriminated against Bessemer steel, engineers preferring to pay the larger price for the greater average uniformity of open-hearth metal. Many specifications give a preference to open-hearth steel by fixing the phosphorus limit at 0.08 per cent. for acid open-hearth and 0.05 per cent. for basic open hearth and for Bessemer, whether acid or basic. This, as explained above, is not, however, a stipulation against basic open hearth steel, for it has been found that no rejections are occasioned by the 0.05 per cent. limit for such metal.

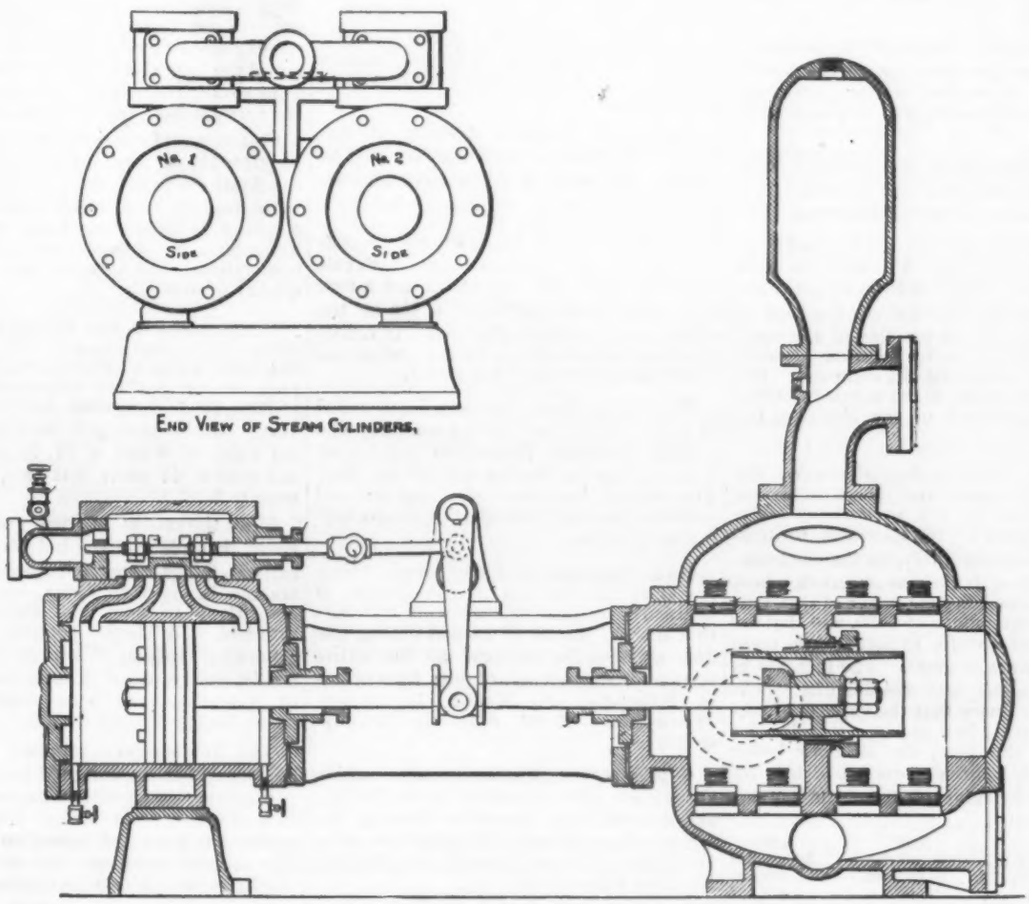
(To be continued.)

The Snow Steam Pump.

The Snow steam pump, manufactured by the Snow Steam Pump Works, at Buffalo, N. Y., represents one of the latest designs in this important branch of steam engineering. It is of the duplex pattern, consisting of two direct acting engines and two double acting pumps so coupled that the steam piston of one actuates through the medium of an arm moving with easy leverage the steam valve of the other. The ordinary form of D slide valve is used, working over ports or openings. The extreme simplicity of this valve and its well-known durability make it of the greatest value in this form of work. The lever through which the motion is transferred to the valve stem is attached to the cross-head of the adjoining half of the pump. This allows one piston to move to the end of its stroke and gradually come to rest. During this gradual motion the steam valve on No. 2 side opens and starts its piston forward; as this piston gradually stops the steam valve on No. 1 side is reversed, and its piston comes to its original position. The advantages of this arrangement are manifold. It allows the machine to run at a high rate of speed without the dangerous shocks found in the single cylinder pump. It does not depend upon a tappet to throw its valve, but the valve receives the full power of the steam piston, preventing all sticking to the seat, which is an important consideration, especially with fire pumps, as they often lie idle for long periods.

In the water cylinder the valve area is made large to insure its complete filling, even when running at its highest speed. It is when running thus that the duplex pattern shows its superiority over the single pump. The destructive pounding incident with single cylinder pumps is obviated.

The water cylinders are usually constructed with a long plunger working in a short ring. Practice has demonstrated beyond a doubt that this form of pump is the best for all work when the water is reasonably free from grit.



End View of Steam Cylinders.

The Snow Steam Pump.—Longitudinal Sectional Elevation.

The idea that the wear would be excessive between the plunger and the inelastic ring is incorrect. The reasons for this are obvious. The settling of all material tending to cut or wear the moving parts is accomplished by providing chambers, into which the water flows before coming in contact with the plunger. The infinitesimal film of water between the plunger and ring furnishes lubrication and prevents metallic contact, while grooves cut in the ring form an effective water packing. When desired, the moving parts are made of bronze. It sometimes happens, owing to acidified water, that the entire water cylinder is cast of the same material. The New York office of these works is at 116 Liberty street, and the Chicago agency is located in the Manhattan Building, in that city.

Pekin now has two ways of communicating by telegraph with European cities, and a direct connection with St. Petersburg has been agreed upon.

THE WEEK.

The new Mexican tariff law which goes into effect November 1 meets with strong opposition in St. Luis Potosi, Monterey, Chihuahua and other cities toward the northern boundary. Many goods are being rushed into Mexico from the United States in anticipation.

Honduras and Salvador signed a treaty of peace.

The American commissioners in Germany are having good success in introducing the old-fashioned rye-and-Indian bread for general consumption.

Nearly 500,000 tons of shipping are under orders from Europe to take away the wheat crop, of which probably 25,000,000 bushels have been sold on European account.

Like Sheffield, Bradford is suffering severely from the operation of the American tariff. In September alone Bradford exports fell off $1,600,000 compared with last year.

The St. Louis Farm Improvement Association are taking measures to secure better freight rates on various railways.

Judge Caldwell, at Fargo, has rendered a decision giving the Northern Pacific a clear title to all lands within its grant not known to contain mineral at the time of filing the map of the location of the road. On the main issue as to taxation of lands the decision is against the company. The decision is claimed to be worth $15,000,000 or $20,000,000 to the Northern Pacific.

The extraordinary importance of the movement in grain and breadstuffs this year is shown by the preliminary statement of exports for the month of September. It is extraordinary, on the one hand, that more than ten times as much wheat was sent abroad in September of this year as in the same month of 1890, and that the value of breadstuffs exported was more than four times as great. The increase in that class alone was $24,262,673. It is also extraordinary that the exports of cotton were hardly half as large in value for September this year, the decrease being $10,236,695. Oil exports also fell off heavily. The comparison for these items is as follows:

	1891.	1890.
Breadstuffs	$31,462,021	$7,199,348
Cotton	10,857,345	21,094,640
Petroleum	3,950,591	5,370,515
Totals	$46,269,957	$33,663,903

The net increase in these classes of exports is $12,606,000, or about 37½ per cent., notwithstanding the great decrease in cotton and oil.

The Western car famine is being more severely felt and railroad men confess that already they are unable to handle the freight offering. At the office of the general freight agent for the Pennsylvania lines west of Pittsburgh, it was stated: "When the corn crop comes in and lake navigation closes we will find the car famine a much more serious matter than at present. At present we are getting along just comfortably, but we have no cars to supply the demand of Western and Northwestern roads, as we usually do. With the enormous crops in the West and the present prospects for foreign demand the railroads will certainly be taxed to provide equipments as they never have been before. The pressure west of Chicago at present is greater than it is in the East and they are worse crippled for transportation equipments than we are.

Ohio's oil production is falling off and will be far behind that of last year. The average per day is now about 55,000 barrels, which is only 15,000 barrels more than the product of the new McDonald field in Pennsylvania.

The Northern Pacific Company have just completed the forwarding of a heavy cargo of tea, numbering some 40,000 packages, received by steamer at Tacoma, being the fourth of similar receipts this year, which are to be followed by several more. The shipment was valued at $525,000, and has been sent East by special trains running on fast time.

New Orleans papers anticipate a vastly increased grain trade by way of Kansas City and the Mississippi River, and urge the necessity of providing extensive grain elevators to facilitate foreign shipments.

The Texas tax rolls for 1891 show an increase of $70,000,000 over the valuation of 1890.

The Kansas wheat yield amounts to 58,000,000 bushels, against 28,000,000 bushels last year, and the corn crop is estimated at 145,000,000.

The recent death of John H. B. Latrobe of Baltimore recalls the fact that he was the last survivor of the party who accompanied Peter Cooper on the trial trip of the first locomotive that ran from Ellicott's Mills to Baltimore. The rather amusing circumstance connected with this event was that the locomotive ran a race with a gray mare that drew a car on the other track, and that the latter, in consequence of a break-down on the part of the "iron horse," became the victor.

The Philadelphia Councils have voted in favor of a contract with a company who promise to filter 10,000,000 gallons of water a day for the supply of the city. The system includes some unique and valuable features, notably the steam sterilizing process.

How important a factor grain transportation has become in the amount of railroad earnings appears from the fact that the C., B. and Q. earned during the first six months last year on the entire system for the carriage of corn from points in Nebraska and Kansas $2,250,000. January and March were the heaviest months.

Capitalists in Philadelphia are pushing the scheme for a steamship line to Mexico, as advocated by James W. Porsch, late United States Consul. Merchants promise 1000 tons of freight a month and $50,000 has been subscribed.

The population of Connecticut has nearly doubled in the last 30 years, the gain being principally in the manufacturing towns. Deposits in savings banks, meanwhile, have run up from less than $20,000,000 to nearly $100,000,000.

California has 4,000,000 orange trees, of which one-quarter are in bearing.

A steamship in the Cuban trade just arrived at this port consumed 50 tons of sugar in lieu of coal. This fuel proved to be an excellent steam generator.

The freshman class of the Massachusetts Institute of Technology numbers 340.

New England cotton mills are running full time, but woolen manufacturers are restricting their output.

It is officially estimated in France that the probable imports of wheat in the 12 months ending July next will be 12,000,000 quarters. The European shortage, as a whole, is commonly believed on this side to have been overrated. The worst accounts come from Russia.

Manufacturing industries in Great Britain offer comparatively little attraction to investors in new enterprises. Consequently there is an increasing disposition to invest in American establishments in connection with English houses.

New York City is lighted by 27,722 lamps and has 368 miles of paved streets.

The National Butchers' Association propose to establish a mammoth slaughtering house in Dallas, Texas, in opposition to rivals in Chicago. In addition to the hog business they will now slaughter each other.

The United States cruiser Atlanta during a terrible gale on the 12th inst., proved herself to be an excellent sea boat, but water entered through a rent in the metal deck, caused by the working of the hawser pipe, filling the forward compartment, and subsequently an explosion took place in the paint room with such violence as to fatally injure several men and endanger the ship. In some way naphtha gas had become ignited from a lantern; the explosion merely bulged a bulkhead, but if the hatch had been blown away, so as to admit the sea, it is surmised that none would have survived the disaster.

Cotton manufacture is making healthful progress throughout the country. While the Southern States are gaining relatively more rapidly than other sections, New England is producing finer yarns than heretofore, in consequence of Southern competition, and turning out a superior quality of goods.

Henry Clews & Co. estimate the total value of the grain crops of 1891 at $1,836,044,542, against $1,403,232,980, and place the value of the exportable surplus at $539,250,000, against $48,150,000 last year. In this they put the Chicago market value of wheat at $1, in both years, and corn at 45 cents this year, against 50 cents in 1890.

Since the census of 1880 great changes have taken place in the industry of range cattle. Large areas once used as ranges are now inclosed as farms, and the cattle are driven to new and distant feeding grounds. A large portion of Texas, Colorado, Oregon, Washington and California, one-third of Kansas and one-half of Nebraska have been converted into farms during the last decade.

The Tehuantepec railroad project in Southern Mexico, designed to connect the two oceans, is again embarrassed by the lack of money, and one of the chief promotors has gone to England for assistance. The indebtedness amounts to $500,000, chiefly to the Chinese contractors.

The law against imported labor gives rise to much contention at Buffalo, Detroit and other points bordering on Canada where considerable numbers have been accustomed to cross over to the American side and compete at lower wages. At Buffalo, until the Palace Car Company employed Canadians, carpenters, painters, smiths, &c., were receiving $2.25 a day, while the Canadians now work for $1.60 a day. And at Detroit mechanics from Windsor have found occupation, much to the dissatisfaction of the local tradesmen. Lately the Union Dry Dock, the Wagner Car Building Works and other establishments are reported to have decided to employ only American citizens.

The transcontinental railroads are much dissatisfied with the arrangement by which they pay a subsidy to the Pacific Mail steamships to prevent competition in the freighting business. The Northern Pacific simply feels that it is called on for too high a percentage, and that the Southern Pacific and Union Pacific should turn over a larger portion of their freight than they do now. The whole scheme is prejudicial to trade between the two oceans and controvenes the Interstate Commerce law, in spirit if not in letter.

The Iron Age

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The Western Wire Industry.

The manufacture of wire is expanding very rapidly in the West, especially in Illinois. It may be doubted whether any other branch of the iron trade can show the same percentage of growth in that section in the past five years, or even an approximate rate of increase. The annual output of wire has not only more than doubled within this period, but new plants are also in course of completion which will add largely to the annual output. In 1886 the wire mills in the Mississippi Valley and the prairie States could be counted on the fingers of one hand. Now they are becoming so numerous that it is somewhat difficult to keep track of them. And while new wire mills are being built the old ones continue to grow, nearly every year having shown an expansion.

Up to the present the manufacture of wire in the West has been an outgrowth of the manufacture of wire products. The Harrison Wire Company, at St. Louis, and the Union Iron and Steel Company, at Chicago, had attempted to manufacture wire for the general market in a former period, but met with financial reverses and were forced out of the field. Manufacturers of barb wire then depended for a considerable time on Eastern sources for their supply of plain wire, but ultimately concluded to experiment in drawing their own wire. Their experiments were satisfactory, both mechanically and commercially, and the wire industry was thus firmly domesticated in the West. Other large consumers of wire have followed the example of the barb-wire manufacturers. All of them have produced more or less wire for the general market besides supplying their own wants.

The wire trade of the West has now grown so large that new enterprises have been undertaken on a scale which would have seemed suicidal to the capital invested but a few years since. The Washburn-Moen Works, at Waukegan, Ill., which are nearly completed, will be capable of turning out a larger product than all the wire mills combined which were in operation in 1886 in Illinois and Missouri. The Chicago Wire and Spring Company will also have in operation in December, at Wireton Park, Ill., one of the largest wire mills in the world, which will, when working up to its full capacity, require the entire product of a modern rod mill to keep it employed. Other enterprises in connection with the manufacture of wire are known to be in contemplation in the West which will be carried out at an early day if the course of trade realizes present expectations.

That the wire industry of the country is in danger of being seriously overdone by the growth of manufacturing in the West is apparent. The course of prices of wire products has been steadily downward for months, and even the improved outlook for general business has been unable to impart any strength to the market. But there is another view to be taken, which is more hopeful as to the West. The Western wire manufacturers have not only the trade to depend upon which has hitherto been supplied from Eastern sources, but they have a steady growth to look forward to. The growth of the West in population and in material prosperity goes on apace, and the consumption of all kinds of manufactured products is stimulated by the ability to get them quickly and cheaply. Manufacturers further east will be obliged to seek new markets for the surplus which cannot be disposed of in their own immediate vicinity, or to turn their attention to new products in the form of specialties, for which they may be able to find a Western market.

Tall Buildings in Chicago.

The erection of more high buildings in Chicago is being opposed by a considerable number of the substantial business men of that city. Public sentiment in this case has undergone a curious change. The development of the Western metropolis from a collection of hastily constructed frame buildings to stately business houses of brick, stone, iron and steel was regarded with great pride by all the citizens. The capitalists who first had the nerve to run up structures six and seven stories in hight were lauded to the skies as men of remarkable enterprise. The era of nine and ten story buildings was hailed as an auspicious omen of the bright future for those who owned Chicago real estate. Then an advance was made to 12 and 13 story buildings without a word of disapprobation from the citizens, who were apparently prouder than ever of the manner in which their builders were reaching skyward. But the 16 and 18 story buildings now being completed, and the still taller edifices contemplated, have induced the inquiry as to whether or not a limit should be established to the ambitious schemes of builders or capitalists. The effect of high buildings is discussed from a sanitary point of view, their probable safety from the standpoint of the engineer and their commercial value to the city in general from the real estate owners' and investors' standpoint. The possibility of the city authorities taking action to restrict future building operations to nine or ten stories is regarded by some real estate owners as sufficiently promising to lead them to take out permits now for high buildings to be erected next year. Meanwhile the manufacturers of structural material and contractors interested in building operations are rather unconcerned in the discussion of the question, as the limitation of hight merely means an increase in the number of business blocks.

Auxiliary Navies.

During the past ten years several of the European naval powers have sought to assure themselves, in the event of war, of the co-operation of the numerous large merchant steamers carrying their respective flags, as auxiliaries to their war fleets, as much for the purpose of protecting their commerce as for destroying that of the enemy. It no longer suffices, as in the past, to convert merchant ships into privateers by granting them *letters of marque*. It has become necessary, in order to utilize them for war purposes, to equip and arm them, and to man them with officers and men from the regular navies who have had special training and instruction.

The problem of employing auxiliary cruisers most effectively without incurring too great an expense to owners and to the government is a vexed one. It has, however, been solved in various ways by different governments, but none of these has been subjected to actual test except the system at first adopted by England, and subsequently modified to remedy the many defects which it was found to contain. There are many difficulties in the way of organizing an efficient auxiliary navy, and as it is next to impossible to convert a mail steamer or cargo steamer of to-day into a full-fledged cruiser to-morrow, there are not wanting those who ask if the hope of utilizing such improvised auxiliary cruisers is not chimerical in an age like the present, when progress in the art of war and war material has been carried so far that even the most desperate and obstinate naval engagement can last but a few minutes, and must be decided quickly.

When we look for a system which, upon the approach of war, will permit of immediately converting the swiftest and most powerful merchant steamers into war cruisers, many and serious obstacles are encountered. This was amply demonstrated in 1885, when war was imminent between England and Russia. England then mobilized her auxiliary navy at an enormous expense, encountered the greatest difficulties in procuring crews and stokers, and many of the vessels requisitioned happened to be scattered in the four corners of the globe. Although enormous sums were spent in what was really only a test, as the auxiliary navy had never been mobilized before, many of the ships that responded to the call never left their ports, and all sorts of delays were encountered in putting the armaments on board of them; in fact, only one steamer, the Oregon, received her guns and carriages of all those which had been requisitioned.

The defects thus brought to light impressed the British Admiralty with the absolute necessity of remedying them, with the result that to-day England possesses an ideal auxiliary navy. The German, French and Italian auxiliary navies are modeled upon the English auxiliary navy, and it is to be hoped that the United States will soon have an equally efficient service. To this end, merchant steamers

arriving at and departing from New York, Boston and San Francisco, and carrying the American flag, are being inspected and reported upon as to their availability for war purposes, alike as auxiliary cruisers and transports.

The Russian auxiliary navy differs materially in its organization from that of any other. It consists of a special fleet of auxiliary cruisers, called the "Voluntary Fleet." The vessels of this fleet are subsidized, and engaged in the mail service between Odessa and the Baltic Sea. It is composed of nine ships, six of which carry their armaments at all times, and are consequently in a state of readiness for war. The remaining three will ultimately receive armaments. The Russian auxiliary navy organization has therefore undoubted advantage over any other in that it is always on a war footing.

The English auxiliary navy is composed of all English steamers which in their construction and arrangements comply with certain conditions imposed by the Admiralty, relating chiefly to the readiness with which guns can be mounted on them, to speed, to coal endurance, and to the provisions made against being sunk. Each such ship is assigned, according to her route, to a naval station at home or in the colonies, to which she is to proceed when called for war purposes; at her station she will find a complete war outfit. All steamers which comply with the Admiralty requirements are subsidized by the Government. Although, this system is not as complete as the Russian, it is nevertheless an excellent one, and considering the number of such cruisers which England can, in a very short time, scatter all over the seas, it more than counterbalances a fewer number in constant readiness, and, furthermore, involves a less expense. War is always preceded by signs, which would enable England to put her auxiliary navy into effectiveness in ample time to meet the demands.

The auxiliary navy of France is closely modeled after that of England, but by no means as extensive or even as perfect, but the requirements of steamers to qualify for this service are far more rigid, but correspondingly well rewarded, if fulfilled. In 1881 France passed certain navigation laws by which ships constructed on plans approved by the Minister of Marine were entitled to a bonus and a premium, but ships already subsidized or subsequently subsidized by the Government could not, even upon compliance with all the requirements, become eligible to these rewards. The requirements were not decided upon until 1884, and during the interval a number of ships were constructed. None of them quite met the conditions imposed, but some of them were, nevertheless, accepted for the auxiliary navy, and granted both the premium and bonus. The requirements are as follows: The ships must be carefully inspected by constructors and engineers, specially detailed by the Minister of Marine, and they must certify as to design, structural strength, seagoing qualities and stability; also to reserve buoyancy. A ship must contain a sufficient number of water-tight compartments, so that in case of being struck by a shot or shell, so as to admit water into several compartments, she will have sufficient reserve buoyancy to keep afloat and to enable her to maneuver with but slight diminution of speed and turning powers. They must be capable of steaming at load draft, corresponding to weight of coal and stores and armament, at a speed of 13.5 knots, and must have a coal capacity for a steaming radius of 6000 knots at a 10-knot speed. The armament to consist of 4.7-inch rapid firing guns, the number for each ship to be determined by the Minister of Marine. The gun positions must be fixed and permanent fittings and so that the armament may be put on board without any alterations or additions. The armament, equipment and stores for each ship of the auxiliary navy are stored at some French naval station most convenient to each particular ship. All arrangements for carrying powder, ammunition, and so on, and for handling the same must be complete.

All these conditions are not always compatible with the service for which many of the vessels are constructed. The requirements concerning the water-tight compartments seem to be the most difficult ones to comply with, and thus far only two ships, the Château Yquem, and Château Margaux, have qualified for the rewards. The Champagne, Gascogne, Burgoyne and Bretagne do, to be sure, fill all the requirements, but they are not eligible to these rewards because they are subsidized. As in the future naval battle the unit will undoubtedly be the fleet, the special duty of the auxiliary cruisers will consist in acting as convoys, transports and commerce destroyers on the high seas.

Western manufacturers of pig iron are encountering a new development in the trade. For some considerable time there has been steady progress in the direction of improving the quality of foundry pig iron. Furnacemen became impressed with the belief that by making a uniform product of high grade they could secure a better price than for the ordinary run of foundry irons. Attention has thus been given to the careful selection of ores, so that an iron might be produced of a soft and yet strong character specially adapted to thin or difficult castings, taking the place of irons of high reputation produced in distant localities and heretofore commanding special prices. Chemists have been engaged to keep close watch of the product and to take instant measures to correct irregularities developed. But a change has also been made by the large consumers. They, too, have engaged chemists to assist in the operation of their foundries. It is the business of these latter experts to formulate foundry mixtures which will produce the kind of castings desired. Curiously enough, they instruct the purchasing department to buy the cheapest brands of pig iron in the market, relying upon their scientific knowledge to work them up satisfactorily. A small quantity of special pig iron may be needed, but the chances are that an equally cheap iron of a different character will be found by the expert to fill the bill. Thus does the progress of science vex the furnaceman and causes his brightest dreams to fade.

The Hoerde Process and Southern Steel.

The most important paper to American metallurgists presented at the London meeting of the Iron and Steel Institute, of which the accounts have just reached us, is that relating to the Hoerde process of desulphurizing pig iron previous to its introduction into the basic or acid Bessemer converter. The paper in question was presented by J. Massenez of Hoerde, and deals with the process to which we editorially referred some time since, giving the results then made available by the publication made in an Austrian paper by Professor Tunner. We understand that the process in question has been investigated by a number of American metallurgists, who have been very favorably impressed with the results obtained. To no section of this country is the matter of greater importance than to the South, where the sulphur question has been regarded as one of the most serious obstacles to the introduction of the basic Bessemer process. It is true that in that section relief has been obtainable from the dangers of too high sulphur by the expedient of washing and crushing the coke, and by the charging of manganiferous ores into the blast furnace. Substantially the process consists of adding to the pig iron produced in the blast furnace a certain amount of iron containing manganese, the reaction being that a sulphide of manganese forms as a slag, thus eliminating the large percentage of sulphur. No difficulty will be experienced in the South in producing for the purpose, from the extensive manganese deposits of that section, an iron sufficiently high in manganese to be used in liberal proportions to carry out the method employed. The use of the Jones mixer, which is employed as the apparatus, in itself yields advantages favorable to its adoption, and in the South its only drawback—the danger of reducing the silicon in the iron—would prove rather an advantage, since high silicon has been the disagreeable characteristic of too many of the irons produced in that section.

We cannot help but regard the Hoerde desulphurizing process as an additional link in the chain which opens out to Southern iron makers an opportunity to become producers of basic steel on a large scale. With the process in question another of the technical difficulties has vanished and the commercial purpose alone is the one requiring consideration. That depends chiefly on distances from the markets, which must be counterbalanced by exceptionally low cost of production. Still, the future is decidedly brighter than the past. The paper which we present elsewhere does not give sufficiently complete data to reach an esti-

mate of the cost of the process. The only indication is that 1.5 to 1.7 per cent. of maganese in the iron delivered from the mixer is sufficient for a satisfactory desulphurization. This would indicate the addition of about 15 per cent. of 10 per cent. spiegel, the cost of which would figure out about $1 a ton for manganese in Northern markets, placing the cost of spiegel at $24, delivered, and of pig iron at $15 per ton at mill. We present elsewhere those parts of the paper which have not been printed previously in *The Iron Age*. In the North the Hoerde process is of the greatest interest to the steel trade of Eastern Pennsylvania, since it makes it probable that the famous Cornwall pig can be deprived of its greatest drawback, high sulphur. It is well known in the iron trade that nowhere in this country can Bessemer pig be as cheaply made as in the Cornwall district, so that it can easily bear the added cost of treatment.

OBITUARY.

SALEM COPELAND.

Salem Copeland, president of the Copeland Hardware Mfg. Company, died at Worcester, Mass., October 10, after a brief illness. Mr. Copeland was born at Thompson, Conn., August 11, 1815, but removed to Worcester when a young man, and has had a life-long experience in the manufacturing business in Worcester, having been connected with the Washburn & Moen Mfg. Company, with the late Ichabod Washburn as tool maker, in their early days also with the Ames Plow Company, and later as superintendent for J. M. C. Armsby in the manufacture of fire arms. Mr. Copeland was also connected with the Providence Screw Company previous to their removal to Providence in 1834. He took a great pride in claiming to have built the first iron planer to run by power ever used.

Mr. Copeland was long and well known in connection with the manufacture of the Cooke extension divider, he being associated with Chas. W. Chamberlin, under the style of Copeland & Chamberlin, in the manufacture until 1889, when he took out a patent on an improved extension divider and organized his business into a stock company, under the style of the Copeland Hardware Mfg. Company, July 24, 1891, he being elected president, with Chas. E. Neale clerk and treasurer, under whose management the manufacture will be continued under the same style as heretofore.

G. S. BARTON.

The Hon. George Sumner Barton of Worcester, Mass., died very suddenly about 2 o'clock Saturday morning of heart disease. He was 66 years old. Mr. Barton was treasurer of the Rice, Barton & Fales Machine and Iron Company, with whom he had been connected for 46 years as an apprentice, as a journeyman machinist, as a foreman, as partner and then as their president when the concern werein-corporated, until he resigned in favor of his son, Charles S. Barton, to become their treasurer. He was also president of the Worcester Safe Deposit and Trust Company at the time of his death. He was a native of West Millbury, Mass.

JOHN BAIRD.

John Baird died at his home in this city, Saturday, aged 71 years. He had been ill for a month. Mr. Baird was born in Scotland in 1820. When 20 years of age he went to Canada and began the study of mechanics. He married in 1842, and the following year came to the United States, settling in Troy. He was employed as mechanical designer in the Burden Iron Works there. By his mastery of all branches of iron designing he soon raised himself to be manager of the shops. In 1850 he became general manager in the Delamater Iron Works in this city. The Cromwell Steamship Company employed him in 1857 to design iron steamships intended to run between this city and New Orleans. For this company, under Mr. Baird's direction and from his designs, was built the first iron steamship ever launched on this side of the Atlantic. Every ship of the Cromwell line's present fleet was built from his designs. He remained in the employ of this company for 20 years. In 1887 Mr. Baird became vice-president of the Metropolitan Elevated Railway Company. He was the executive officer under whose supervision the construction of the Sixth and Second avenue lines was carried on. After the elevated railroad lease to the Manhattan, Mr. Baird retired from the vice-presidency, and from that time until within a few months of his death had employed himself in patenting inventions for engines and boilers.

FREDERICK J. SLADE.

Frederick J. Slade, general manager of the New Jersey Steel and Iron Company, died on October 11 of creeping paralysis. Born in 1843, in Boston, he graduated from the College of the City of New York and entered the Morgan Iron Works as a machinist. Subsequently he became associated with the work of building the famous Stevens torpedo, and in the year 1867 entered the employ of Cooper, Hewitt & Co. Subsequently he was made treasurer and general manager of the New Jersey Steel and Iron Company, with the development of which he had been ever since connected.

JOEL BENEDICT HARRIS,

president of the Springfield Foundry Company, died at his home in Rutland, Vt., on the 19th inst. He had a stroke of apoplexy while coming from Springfield, Mass., on the train last Thursday, and remained unconscious up to his death. He was born at Sterling, Conn., November 5, 1822, entered Rensselaer Polytechnic Institute, Troy, N. Y., in 1840, and graduated in civil engineering. He did the grading, the masonry, the building and track laying on the New York, New Haven and Springfield Railroad, Boston and Albany, Harlem and other roads. He lived for several years in Springfield, Mass., went to Rutland in 1860, and for 22 years was engaged in the car wheel and general foundry business under the name of the Rutland Foundry Company. In 1882 the business was reorganized as the Harris Mfg. Company, and has since been conducted with Mr. Harris as president. He was also president of the Springfield Foundry Company, Springfield, Mass.

The Queen and Crescent route has issued a tariff sheet, effective October 15, giving rates on iron and its products, except pig, from the principal points in Alabama and Chattanooga, Tenn., to all points identified with the iron products enumerated in the list. The sheet also gives a list of the articles taking special iron rates.

The M. Steele Company of Springfield, Ohio, who have furnished the cast-iron work for the Broadway cable road, New York, have shipped the last consignment of a total of over 5000 tons of castings.

The Allentown Iron Company, Allentown, Pa., are relining and otherwise repairing their No. 4 furnace.

The Hoerde Desulphurizing Process.*

BY J. MASSENEZ, HOERDE.

If in the acid and the basic Bessemer processes the molten pig iron is taken direct to the converter from the blast furnace there is the disadvantage that the running of the individual blast furnaces can hardly ever be kept so uniform as it is desirable should be the case in order to secure regularity in the converter charges. In the manufacture of Bessemer steel the variable proportions of silicon and of carbon here come chiefly under consideration, while in the basic process it is chiefly the varying proportions of silicon and of sulphur; and in cases where either ores containing variable percentages of phosphorus or puddle slags are treated the varying proportion of phosphorus has also to be considered. This disadvantage of the irregular composition of the individual blast furnace charges is obviated in a simple and effective manner by W. R. Jones' mixing process. In this as much pig iron from the various blast furnaces of a works as is sufficient for a large number of Bessemer charges—say, from seven to twelve charges, or, in other words, from 70 to 120 tons of pig iron—is placed in a mixing vessel. Only a portion of pig iron placed in the mixer is taken for further treatment for steel, while new supplies of pig iron are brought from the blast furnace. In this way homogeneity sufficient for practical purposes is obtained. In the treatment of phosphoric pig iron, which is employed in the production of basic steel, it is, however, not sufficient merely to conduct the molten pig iron in large quantities to the converter in a mixed condition, but the problem here is to render the proportion of sulphur also independent of the blast furnace process to such an extent that the proportion of sulphur in the finished steel is so low that the quality of the steel is in no way influenced by it. The question of desulphurization has, especially of late years, become of the utmost importance—at any rate, for the iron industry of the Continent. By the great strike of 1889 the German colliers have succeeded in greatly improving their wages, and with this increase in wages not only is there a distinct diminution in the amount of coal wrought, but, unfortunately, the coal produced since then is raised in a much less pure condition than was formerly the case. Consequently the proportion of sulphur in the coke has considerably increased. Whereas formerly this proportion did not exceed 1 per cent., it has now in many cases risen to 1.8 per cent., so that an unpleasant ratio exists between the wages of the workmen and the amount of sulphur in the coal raised. It is, therefore, not remarkable that, even when ores fairly free from sulphur are treated, it easily happens that a sulphuretted pig iron is obtained. In order to effect satisfactory desulphurization attention has been bestowed on the fact that iron sulphide is converted by manganese into manganese sulphide and iron. If sulphuretted pig iron, poor in manganese, is added in a fluid condition to manganiferous molten pig iron, poor in sulphur, the metal is desulphurized and a manganese sulphide slag is formed. It may be urged that it does not seem necessary to effect the desulphurization by means of the reaction of the manganese and iron sulphide outside of the blast furnace, as it is possible by suitably directing the blast furnace process, by the employment of manganiferous ores or highly-basic slag, so to desulphurize the iron in the blast furnace itself that it would be unnecessary further to lower the percentage of sulphur. Every blast

* Read at the London meeting of the Iron and Steel Institute.

furnace manager, however, will have observed that, even with every precaution in the blast furnace practice, pig iron will often be obtained with so high a percentage of sulphur as to render it useless for the Bessemer acid or basic processes. If the desulphurization in the blast furnace is carried sufficiently far it is always necessary to work the furnace hot, and thus to obtain hotter iron than is desirable for further treatment in the converter. On the other hand, the method of desulphurization outside the blast furnace, described in this paper, presents the double advantage that part of the blast furnace can be kept cooler, and thus lime and coke be saved, and that there is a certainty that no red-short charges are obtained in the converter, while the pig iron passes to the converter at a suitable temperature.

A further advantage presented by the direct process described in this paper is that the Bessemer works are independent of the time at which the individual blast furnaces are tapped, as the pig iron required for the Bessemer process can be taken at any moment from the desulphurizing plant. In Hoerde, where the mixing and desulphurizing process has for a considerable time been regularly in use, it has been found that all the chief difficulties formerly encountered in the method of taking the fluid pig iron direct from the various blast furnaces to the converter have been obviated. At Hoerde the mixing and desulphurizing plant shown in the accompanying diagram is employed. This apparatus holds 70 tons of pig iron. It is, however, advisable to have an apparatus of greater capacity—say 120 tons. The apparatus has the shape of a converter, and the hydraulic machinery by which it is moved is simple and effective. An hydraulic pressure of 8 atmospheres is sufficient to set it in motion. The vessel is provided with a double lining of fire bricks of the same quality as those used for the lining of blast furnaces. This lining is gradually attached only along the slag line, and does not require repair until it has been in use for some six weeks. Further repairs are then necessary every three weeks. Only the few courses of spoilt bricks are renewed, and for the repairs, including the cooling of the vessel, a period of two to three days is required. At the end of the week the vessel is kept filled, so that its contents suffice for the last charge to be blown on Saturday. On Sunday night the vessel is again filled. The consumption of manganese is very low. Theoretically it is the quantity required for the formation of manganese sulphide, and in practice it has been found that this amounts to about 0.2 per cent. The proportion of manganese which the desulphurized pig iron coming from the vessel should contain is best kept at about 1.5 per cent. in order to render the desulphurization as complete as possible. Thus, a mean proportion of 1.7 per cent. of manganese in the pig iron passing into the vessel is more than sufficient to effect a thorough desulphurization. Indeed, 10 to 12 per cent. of manganese is sufficient to effect a satisfactory desulphurization. For the extent of the removal of the sulphur, the temperature and the duration of the reaction are of importance. It has been found that if highly sulphuretted pig iron is poured from the blast furnace into the desulphurizing vessel, 15 to 20 minutes are sufficient to effect the desulphurization requisite for the steel process. The part played by the duration of the process is seen from the results obtained with the last charges, if the vessel is emptied at the end of the week without fresh pig iron being added from the blast furnace. If, for example, 60 tons of pig iron with 0.065 per cent. of sulphur remain in the vessel, the proportion of sulphur with the last charges falls to 0.03 per cent. The iron in the vessel remains sufficiently fluid for several hours. When necessary, a little wood is thrown in. It has been found quite unnecessary to obtain heat by passing and burning a current of gas above the bath of metal. The following are analysis of the daily samples taken during the course of a month in so far as they relate to sulphur, silicon and phosphorus:

Date.	P.	Mn.	Si.	S.	Percentage of sulphur in iron from the furnace.
1	2.82	1.53	0.13	0.053	0.216
3	2.74	2.97	0.28	0.036	0.135
4	2.88	1.96	0.21	0.051	0.348
6	2.86	1.25	0.28	0.035	0.265
7	2.87	1.36	0.17	0.078	0.481
10	2.74	1.31	0 23	0.036	0.176
11	2 90	1.15	0.13	0.074	0.147
12	2.80	1.22	0.20	0.072	
13	2.88	1.33	0.16	0.075	0.142
14	2.82	1.55	0.21	0.067	
15	2.80	1.33	0.13	0.063	0.130
17	2.93	1.39	0.19	0.049	0.105
18	2.73	1.19	0 27	0.059	0.135
19	2 74	1.70	0.28	0.059	0.129
20	2.84	1.39	0.31	0.073	0 143
22	2.69	2.01	0.44	0.051	9.173
24	2.88	1.49	0 15	0.052	0 125
25	2.83	1.79	0.18	0.038	0.164
26	2.69	1.27	0.11	0 070	0.372
27	2.85	1.30	0.26	0 065	0.182
	2.85	1 19	0.36	0.070	
	2.82	1.42	0.16	0 048	0.105
	2.62	1.34	0.17	0.063	0 100

The following are some of the results obtained in working where samples of the pig iron employed were available for analysis:

		Per cent. of sulphur.
1. *a.*	From the vessel, charge No. 852.....	0.036
b.	From the blast furnace, No. 4	0.135
c.	From the vessel, charge No 853.....	0.032
2. *a.*	From the vessel, charge No. 1290	0.058
b.	From the blast furnace, No. 4	0.372
c.	From the vessel, charge No. 1291	0.077
3. *a.*	From the vessel, charge No. 1534	0.059
b.	From the blast furnace, No 2.....	0.217
c.	From the vessel, charge No. 1535 ...	0.068
4. *a.*	From the vessel, charge No. 1538	0.059
b.	From the blast furnace, No. 2...	0.352
c.	From the vessel, charge No. 1539	0.074

The following figures give: (*a*) Details of a series of tappings from furnaces 1, 2 and 4, in the order in which they pass to the desulphurizing plant; the quality of sulphur represented being also given:

No.	Blast furn'ce.	Weight in kilograms.	Sulphur. Per cent.	Sulphur. Weight in kilograms.
1	4	10,400	0.481	50 024
3	1	13,100	0.068	8.908
5	2	11,400	0.067	7.638
7	4	10,100	0.216	21.816
9	1	12,200	0.100	12.200
11	2	12,700	0 120	15.240
14	4	10,400	0.176	18 304
16	1	13,200	0 084	11.088
19	2	12,500	0.074	9.250
21	4	9,400	0.105	9.870
23	1	11,600	0.059	6.844
25	2	11,300	0.073	8.395
Totals.....		138,500	.....	179.577

(*b*) The corresponding quantities of desulphurized pig iron passing from the vessel to the converter:

No.	From the vessel, charge No.	Weight in kgs.	Sulphur. Per cent.	Sulphur. Weight in kgs.
2	104	10,700	0 078	8.034
4	105	10,400	0.099	10 296
6	106	10,100	0.085	8.585
8	107	10,400	0.086	8.944
10	118	9,400	0.074	6.956
12	119	10,500	0.072	7.560
13	110	10,900	0.075	8.175
15	111	10,500	0.067	7.035
17	112	10,400	0.063	6.552
18	113	10,300	0.074	7.622
20	114	10,200	0.049	4.998
22	115	10,500	0.059	6 195
24	116	10,300	0.059	6 077
26	117	10,100	0 057	5 757
Totals.....		144,300	.....	102.786

Recalculated, these totals represent respectively 138,500 kgs. of pig iron and 98.654 kgs. of sulphur. Thus, from 138,500 kgs. pig iron there has been eliminated 179,577 — 98,654 = 80,923 kgs. of sulphur, or, in other words, 45,063 per cent. The proportion of sulphur in the slags rises with that in the iron from the blast furnace to 17 per cent., an inappreciable portion of the sulphur of the slag being oxidized to sulphurous anhydride by access of air. An analysis of the slag yielded the following results:

	Per cent.
Sulphur.....	17.07
Manganese	30.31
Phosphoric anhydride.....	0.61
Iron.....	7.13
Bases.....	35.04

An analysis of an average sample gave:

	Per cent.
Manganese sulphide.....	28.01
Manganous oxide.....	20.23
Ferrous oxide.....	25.46
Silica.....	18.90
Alumina.....	5.00
Lime.....	3.53
Magnesia.....	0 43

The great convenience and certainty presented by the method described in this paper will in all probability lead to its general adoption. As a matter of fact, several works are now occupied with the installation of this mixing and desulphurizing plant.

Harrison Loring's Failure.

After 40 years of successful business, Harrison Loring, proprietor of the City Point Works, South Boston, Mass., has made an assignment for the benefit of his creditors. Two years ago this firm received their first contract from the United States Government, and while these contracts are not altogether responsible for the firm's troubles, the failure on the part of the Government to pay the twelfth payment out of the 20 that were to be made upon the cruiser at the time Mr. Loring had counted upon precipitated the assignment. The liabilities are said to be in the vicinity of $375,000, while the nominal assets will amount to nearly $800,000. The principal vessel upon which the works are now engaged is known as cruiser No. 11, for which the contract price was $674,000, with an additional $100,000 for 18-knot speed, while three Government tugs are rapidly approaching completion. Besides this work there is a large amount of work being done for private corporations and individuals. The creditors are chiefly banks in Massachusetts and corporations engaged in the steel and iron trade in Pennsylvania. A meeting of the creditors has been called for next Saturday, at the works, when suitable action will be taken to adjust the affairs. It is understood that arrangements have been made with the Navy Department for the work to be continued by the assignees, so that the creditors may reap the benefit, as far as possible, on all the contracts. In the meanwhile the works will run as usual, employing their full force of hands. The failure was a matter of great surprise to those connected with the works and the outside acquaintances of Mr. Loring, all of whom testify to his ability as a business man and to his integrity and generosity as an associate and employer. The assignees are Hon. Chas. H. Allen of the Central National Bank of Boston and George W. Quintard of New York.

Disquieting rumors are afloat concerning the enterprises identified with the boom town of Middlesborough, Ky. A. A. Arthur, general manager, has resigned.

There is a movement for a World's Fair in Germany in 1896. The Verein zur Beförderung des Gewerbfleisses, a very influential body, is taking the initiative.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., October 20, 1891.

The Secretary of the Navy has received the last of the Bureau reports, and will now begin the preparation of his own annual official review of the fiscal year 1890–1. The Secretary's report will, of course, enter into the usual resumé of the financial and statistical history of the department in a comparative way for the past few years, in order to illustrate the rate of progress in the important duties under his immediate care. He will also give a synoptical exhibit of the salient features of the work of the different departmental bureaus, their respective reports covering matters in detail, and will make certain recommendations which will be in the line of progress, even at accelerated pace, as compared with the past years of the present administration. The work of the Bureau of Construction, steam engineering, ordnance and yards and docks, is now well established in their respective lines of naval construction and equipment in warlike appliances. It is the object of Secretary Tracy to afford his bureau chiefs, Wilson, Melville, Folger and Farquahar, every facility for continued development in their lines of duty.

The new navy of the United States in ships of the armored cruiser and other fighting types, in engines and other machinery, ordnance and torpedoes, as far as it has gone, is second to no nation on the globe. What it lacks in numbers it is rapidly equalizing in advanced improvements and greater qualities of offense and defense. At the present rate of progress, with reasonable liberality on the part of Congress, in another ten years the disparity of numbers between the American navy and the navies of the maritime powers of Europe will not be so great. In speaking on the subject of naval progress Secretary Tracy said: "When the ships now in course of construction, the last of which will be afloat by the close of the present Administration, are completed we will take a very creditable rank among the nations of the globe as a naval power. In the work of the immediate future we must turn attention to the construction of a fleet of effective vessels of a smaller type for service on our own and foreign coasts like China. These should be vessels of light draft, but equipped with effective batteries of high power and machine guns. The old vessels which have been doing the peculiar service incident to naval movements in China or on any other coasts are in many cases practically unseaworthy and should be replaced by vessels of modern types. The moral effect of the presence of such vessels would be felt at once. Besides, we require a fleet of this class for service on our own coast.

"Congress should appropriate for a few vessels of the armored and cruiser types, in order to keep the work of increase of the navy moving forward, because building great iron ships is a process of mechanical detail, and cannot be expedited with advantage, but a fleet of 10 or 12 gunboats, to cost about $300,000 apiece, could be quickly built and put into service."

The Berlin Iron Bridge Company of East Berlin, Conn., have received the contract for the new blacksmith shop building for the Dixon Mfg. Company of Scranton, Pa. Owing to the peculiar formation of the ground, the building will be in the form of a letter t, and will be 60 feet wide by 235 feet long, constructed entirely of iron.

The New Sternbergh Works.

A number of specially invited guests recently visited the bolt and nut works of J. H. Sternbergh & Son of Reading, Pa. It will be remembered that on the night of February 6 the entire plant, with the exception of the rolling mill and Mr. Sternbergh's private office, was destroyed by fire, entailing a loss of $300,000. Immediately after the fire the work of clearing away the *débris* began, and on March 17 the contract for the iron structural work was let. During this time the rolling mill was running night and day, and machines for turning out bolts and nuts were set up in the rolling mills, and engines set up to run them. Wherever possible this was done, and the work of putting up the new shops hurried forward as rapidly as first-class workmanship would allow. The new office building stands on the corner of Third and Buttonwood streets. It is of sandstone and brick, 44 x 32 feet, three stories high, and finished throughout in oak. The first floor is used as an office, and is large, light and airy. The second floor is also used as an office. Here the oak is finished in the style of the sixteenth century. The third floor is used as a storage room for stationery and probably as a drafting room. Back of Mr. Sternbergh's private office is a room for his private secretary, and both the first and second floors contain burglar and fire proof vaults.

The main building is built of brick and iron. It is 360 feet long and 180 feet wide. The roof is made of corrugated steel, and in the roof are 178 skylights, each one being eight feet square. The roof is supported by a row of Phœnix columns, 36 feet apart, giving plenty of room. In the main room are located the forging, threading and finishing departments. The rolling mill, which connects with the main building, contains three trains of rolls, operated by three upright engines of 250, 125 and 50 horse-power respectively, specially built at the works for the purpose for which they are used. The forging department is subdivided into forging and smithing departments, all under one roof. In the smith department is where hammers, drop presses, bending, shearing and punching machines are used. In the forging department nothing but crude petroleum is used for fuel. The oil is conveyed to the forges in pipes, and by the aid of a burner of Mr. Sternbergh's own patent air is conveyed through a 3-inch pipe and sprayed. By this process all rough forging of bolts, blanks, rivets, nuts and washers, sleeve nuts, turnbuckles, &c., are manufactured. Threading and finishing departments occupy a space 312 x 53 feet, and here is where the bolts and nuts are completed—that is, milled, pointed, tapped, reamed, polished and cold punched. Some of the machinery is very ponderous, especially that at the south end, where the cold punching is done. One of the curious products of this department is a washer that is made of steel and cut so that both ends stand apart. This is used instead of a common washer on railroads, the cut washer acting as a spring and holding the nut in place much more rigidly.

The machine shop is a two story triangular building of brick, 90 feet on the south side, 84 feet on the east, and 30 feet on the north. The first floor is devoted to the use of a general machine shop. Here the last machine injured in the fire was being repaired. It is a carriage bolt machine and is very heavy. The second floor in part is used as a machine shop also, and the other portion is occupied by the pattern makers. An 80 horse-power automatic high-speed Ide engine runs the machinery. All the patterns of the valuable machinery of Mr. Sternbergh's own patents were destroyed, together with the drawings, but work on reproducing them has commenced. Dividing the machine shop is a large open space which allows both teams and trains easy access to the warehouse, a four-story 150 x 40 feet brick building containing goods in stock, and equipped with two powerful freight elevators. The old office building is uses as a timekeeper's office, a storeroom for tools and small supplies, and as an office for Superintendent Brill of the forging, threading and machine departments. Mr. Hutchinson is superintendent of the rolling mills.

Mr. Sternbergh is the owner of the land bounded by Buttonwood, Third and Fourth streets and the Lebanon Valley Railroad, which in all contains 8 acres. On it is located a stone quarry from which the stone for the heavy foundation of the buildings was taken, and also a brickyard. In all about 500 hands are employed in the works. The threading and finishing departments are paved with 5-inch hemlock blocks set on end. This is an original idea with Mr. Sternbergh, and is said to make a very durable floor—even more so than asphalt blocks. In other departments brick walks and asphalt truck roads have been put down.

The American Tin Plate Company's New Plant.

(By Telegraph.)

On Saturday, October 17, the American Tin Plate Company of Elwood, Ind., the president of which is Col. A. L. Conger of Akron, Ohio, closed contracts for a large portion of the machinery that will be required for their new tin-plate manufacturing plants. The company have secured a desirable location, comprising 25 acres in the new manufacturing town of Elwood, Ind. The town is about 137 miles from Cincinnati and about 224 miles from Chicago. The location is an admirable one, it being in the center of the great Indiana natural gas belt, and from the indications that supply will be ample for many years to come. It is the intention of the company to erect only the most substantial buildings, the rolling mills being covered with iron structures and the other buildings, in which the pickling, tinning, annealing and packing departments are situated, will be of brick with iron roofs. The company will start with a plant consisting of four 20-inch hot rolling mills, and four 18-inch cold rolling mills. The four 20-inch mills will be driven by a 36-inch by 48-inch Porter Hamilton engine, and the 18-inch mills by a 28-inch by 42-inch engine of the same make, the former engine being geared and the latter attached to trains direct. These engines will develop 1800 horse-power, and both will be furnished by William Tod & Co. of Youngstown, Ohio. All of the mills will be built by the Robinson-Rea Manufacturing Company of Pittsburgh. The Sterling Boiler Company of Barberton, will supply the boilers, which will develop 1000 horse-power, while the machinery, pots and castings for the tinning department will be built by the Lloyd Booth Company of Youngstown, Ohio. The tinning department will consist of ten furnaces containing six pots each, the grease pot being supplied with Morewood's fire-roll machines, five pots being fitted with single and five with double machines. The company expect to be turning out bright and roofing plates in 90 days from the time work is commenced. The capacity will be about 4000 boxes of plates per week.

MANUFACTURING.

Iron and Steel.

The Findlay Rolling Mill Company, Findlay, Ohio, manufacturers of bar iron, have completed the rebuilding of their muck mill, which was partially destroyed by fire last June. The new rolling mill is larger than the old one, and more complete in every respect. The daily output is much increased and the quality meets the demands of the most careful and particular buyers. This firm are also very busy in the finishing department of their plant, making a special grade of iron for chains, bolts, nuts, &c. Their chain and tool departments are being operated to their utmost capacity in order to meet the demands of customers, and shipments of these goods are made to every State in the Union. The above named firm operate the plants of the Briggs Iron and Tool Company and the Sterling Chain Company.

The Stewart Iron Company, Limited, Sharon, Pa., contemplate making some extensive improvements to their No. 2 furnace, at that place. At present they are receiving bids for the erection of three fire brick hot-blast stoves, and the particular type of stove to be adopted will probably be decided during the present week. Their No. 1 furnace continues in blast and is making a good record.

A fatal explosion recently occurred at the Black Diamond Steel Works, Pittsburgh, seriously injuring one man and causing the works to be closed.

Kemble Furnace, at Riddlesburg, Pa., has been sold at sheriff's sale to Adolphus Snedburg of New York, trustee, for $5700.

The backbone of the strike at the rolling mills at Lebanon, Pa., which has been raging since July 1, has been broken, and the struggle has been virtually a failure on the part of the men. All the puddling furnaces at the West End Rolling Mill started up on the 15th, and the other mills and furnaces at Lebanon are now running full handed and many of them on double turn. Over 500 men are idle owing to the strike, but it is said that a majority of them will leave the association and eventually be taken back.

The Puget Sound Iron Company, Seattle, Wash., have filed articles of incorporation. The capital stock is fixed at $1,000,000, divided into 10,000 shares at $100 per share, and the right is reserved to increase the capital stock to $2,500,000.

The sale of the plant of the Cameron Iron and Coal Company of Emporium, Pa., which was announced to take place in the court house at Pittsburgh on Wednesday, the 14th inst., was postponed by the Special Master, W. L. Chalfant, until October 28. The plant of this firm is located at Emporium, and consists of a blast furnace 75 x 16 feet in size, and equipped with three Siemens Cowper stoves, each 70 x 18 feet, and turns out about 40,000 tons of pig iron per year.

In the rod department of the Beaver Falls Mills of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa., there was produced in one turn, on the night of the 13th inst., 324,550 pounds of wire rods. This is claimed to be the largest production in one turn ever turned out in any rod mill in the country.

The Struthers Furnace Company, Struthers, Ohio, are making a number of repairs to their Anna Furnace, at that place. They are putting in six 50-inch flue boilers 30 feet long, a new large-sized Crane hoisting engine and two new pumps. The furnace has been given a complete overhauling, and will be in first-class condition when put in blast again, which will be done during the latter part of this month.

About two years ago the Raney & Berger Iron Company, New Castle, Pa., erected an additional stack in order that they would always have an auxiliary stack which could be put in operation at any time that their other stack would have to close down for any reason. During the present year the firm tore down the old stack and have built a new one in its place. They are now putting the lining in, so that the furnace will be ready for blast whenever needed. It is the intention of the firm to operate but one stack at a time.

The Ridgway steam hydraulic cranes, built by Craig Ridgway & Son, have been adopted by the Old Dominion Iron and Steel Works of Richmond, Va. One of these cranes of 5 tons capacity will be set up in the yard outside the puddle mill and with it one man will pick up and weigh and load on the cars the entire product of 20 double puddling furnaces.

Salem Furnace, at Salem, Va., has been completed and put in blast.

It is authoritatively stated that the sale of 150,000 acres of coal, iron and timber land in eastern Kentucky, embracing the Cumberland Valley Colliery Company's plants at Pinevill e to a Belgian and English syndicate for the sum of $5,000,000 has been consummated. The purchasers will develop the property by constructing a railroad, erecting blast furnaces and coke ovens and opening coal mines.

The citizens of Blairsville, Pa., are making an effort to establish a rolling mill and tinplate works in that place. About $65,000 will be required, toward which it is said $50,000 has already been subscribed.

The Louisville and Nashville Railroad Company are said to have subscribed $100,000 to the stock of the Southern Steel Company, who are organizing to build a steel plant at Ensley City, Ala. The proposed capital is $800,000, of which $750,000 is now subscribed.

It is reported that the Norton Iron Company will arrange their furnace at Ashland, Ky., for the manufacture of iron by the Bessemer process.

The Stanley Furnace and Land Company will build a furnace at Stanley, Va.

The Ironton Coal and Iron Company have been incorporated under the laws of West Virginia with a capital stock of $3,000,000. This company operate the Ætna furnace at Ironton, Ohio.

A report has been put in circulation in Western newspapers that the Illinois Steel Company will, at an early day, erect a Bessemer steel plant at their Bay View Works, near Milwaukee. While it is probable that at some time in the future such an addition may be made to these works, the project has not been definitely approved by the directors of the company, and until that is done all such reports are decidedly premature.

A deal has been closed in Sheffield, Ala., by which Colonel William Duncan and associates secured the entire assets of the Sheffield Land, Iron and Coal Company, the capital stock of which is $1,000,000, all paid. Colonel Duncan took it at 97 cents. A new company was formed with $5,000,000 stock, and over half of it was taken within an hour. Three more furnaces will soon go in blast.

Among the latest to adopt the Ridgway steam hydraulic crane are the Benwood Iron Works of Wheeling, W. Va. Instead of handling the nail plate strips by hand, as heretofore, the Ridgway crane will do all this and besides will be provided with a Dennison weighing machine, so that they will be handled and weighed at one operation.

The plant of the National Forge and Iron Company, at East Chicago, who made an assignment August last, has been ordered to be sold by the receiver on October 27. The works formerly did a business of $1,000,000 a year and employed about 300 hands.

King John Furnace No. 1 of the De Bardeleben Coal and Iron Company, at Bessemer, Ala., has blown in after an idleness of two months. All five of the De Bardeleben furnaces are now running, and also No. 1 Oxmoor Furnace, operated by this company, which have only just resumed after being banked for some time on account of the shortage of coal.

The Eagle Rolling Mill Company of New Ulm, Minn., capitalized at $300,000, have filed articles of incorporation.

The old Alcalde Furnace, at Rusk, Texas, the property of that State and operated in connection with the State penitentiary, recently shipped 300 tons of foundry iron to Mexico. This is said to have been the largest consignment of pig iron ever sent from the United States to the republic of Mexico.

The Phœnix Iron Company of Phœnixville Pa., have secured the contract for the roof trusses over the car shed of the Reading terminal at Philadelphia. The spans will reach a distance of 356 feet, the arch of each being 415 feet.

On Thursday, the 15th inst., a conference was held between Chas. M. Schwab, general manager of the Edgar Thomson Steel Works of Carnegie Bros. & Co., Limited, Bessemer, Pa., and a committee of workmen of the converting department of the plant. The conference was for the purpose of arranging the scale of wages to be paid the men in that department, to go into effect on January 1 of the coming year. The scale now in force expires on the last day of this year. The conference lasted all day, and a scale of wages was agreed upon, but was not made public. From some of the workmen, however, information was obtained that some very heavy reductions have been made. Under the old scale the steel melters were paid $1.06 per 100 tons; the new scale as first submitted by the firm asks them to accept 62½ cents per 100 tons, or nearly 50 per cent. of a reduction. The men compromised by accepting 65 cents per 100 tons. Under the old scale they made $195 a month, and by the reduction they will earn about $117.50. The vessel repairers were reduced from 37 cents per 100 tons to 26 cents. Under the old scale wages were about $150 per month, while under the new one they will earn about $100 per month. It is stated that the vesselmen will suffer the greatest reduction. They have been making about $200 per month, and it is said that the new scale reduces their wages about 50 per cent. On Saturday, the 17th inst., the scale for the blooming mill was arranged. It is stated that the ladlemen have been reduced from $1.19 per 100 tons to 89 cents. Other departments have been reduced in proportion. It is probable that during this week the scale for the rail department will be taken up and will probably be adjusted to the satisfaction of both sides. From present indications there will be no trouble of any kind over the arrangement of the new scale as the men realize that the introduction of new and improved machinery will permit of their making a greater tonnage, and while their wages have been considerably reduced they will still have the benefit of an increased output. It is probable that within a week or ten days at the furthest the scale for the entire plant will be agreed upon and adopted.

A meeting of the creditors of the Oliver & Roberts Wire Company, Limited, of Pittsburgh, was held in that city on Friday, the 16th inst. The company presented a statement of their assets and liabilities, and also submitted a proposition for the payment of their indebtedness in five equal installments, with interest at 6 per cent. per annum. This statement showed the assets of the firm to be $1,900,220, and liabilities of $1,087,460, leaving a surplus of $812,760. The statement and proposition were referred to a committee, consisting of A. H. Childs, John Z. Speer, John Richardson and M. B. Cochran, who, after examining the statement and fully considering the matter, reported in favor of accepting the proposition and granting the extension. This report being presented at the meeting was unanimously approved. As stated above, the firm's assets exceed their liabilities by over $800,000, and there seems to be no doubt but that the company will obtain the required time and will be able to pay their indebtedness in full.

In reference to a newspaper statement recently made that the Whitaker Iron Company of Wheeling, W. Va., proposed to engage in the manufacture of tin plates, we can state that the report is untrue. The Whitaker Iron Company, like many other manufacturers, have been interested in the tin-plate question, and believe that with a sufficient and stable protective duty it will be but a matter of a few years when the market can be supplied wholly by American manufacturers and without disadvantage to the customers. Up to this time the firm have not taken any steps looking to the manufacture of tin plate, and do not expect to take any action in the matter in the near future.

Furnace A of Carnegie Bros. & Co., Limited, Bessemer, Pa., which has been running on spiegel for a long time, has been found to be in an unsafe condition and will be torn down. The contract for the removal of the stack has been let to Chas. Cardon and work has already been commenced. A new furnace will be erected in its place as soon as possible. During the time of construction one of the other eight furnaces owned by this firm at Bessemer will be operated on spiegel.

A 40-ton steam hammer to be used by the Carpenter Steel Company of Reading, Pa., for forging the 12-inch steel shells for the Government has been received by the firm, and will be placed in position during the present week. In addition to the large contract to furnish the Government with steel projectiles, which will take the company about a year to fill, they also have large orders on hand for merchant steel.

The J. W. Porter Boiler and Tank Company of Pittsburgh are erecting the wrought-iron work for six gas producers to be placed in the La Belle Steel Works of Smith Bros. & Co., Allegheny, Pa., and for the same number to be placed in the plant of the Pittsburgh Plate Glass Company, at Creighton, Pa.

A charter has been granted to the Allequippa Steel Company of Pittsburgh, with a capital stock of $150,000. The incorporators are B. Forst, J. S. Kaufman, Jas. F. McLaughlin, Jas. C. Russell and Jas. Kountz. This company is identified with the J. C. Russell Shovel Company, which concern have also been granted a charter of incorporation, and both plants will be erected at Allequippa, a few miles from Pittsburgh on the line of the Pittsburgh and Lake Erie Railroad, and direct connection can also be had with the main line of the Pittsburgh, Ft. Wayne and Chicago Railway. It is the intention of the Allequippa Steel Company to manufacture steel by a new process, the product to be consumed by the J. C. Russell Shovel Company. Operations on the erection of the plants have not yet been commenced, but work will probably be started as soon as all the details of the organization of the company have been effected.

Morris, Tasker & Co., Incoporated, Philadelphia, report that they have resumed work at the Delaware Iron Company's Works at New Castle, Del., having only been stopped two weeks on account of the late fire. The men are working under temporary shelter, but the company will soon replace the burned buildings with a fine iron structure about 300 x 150 feet, which is to be completed by December 1. The contract was awarded to the Berlin Iron Bridge Company The works when in full operation employ about 1000 men.

An effort is being made by the recent purchasers of the works of the Crown and Cumberland Steel Company of Cumberland, Pa., to reorganize the concern and put it in operation. Cumberland has been asked to subscribe $30,000 toward the new plant and to make some public concessions.

Machinery.

The Robinson-Rea Mfg. Company, manufacturers of rolling mill machinery of all kinds, are operating their plant to its full capacity, and report plenty of orders on hand. For the nine months of this year ending September 30 this firm did a larger business than during the entire year of 1890. In view of the depression which has existed in manufacturing circles during the present year, this is certainly a very excellent record.

Grant Machine Tool Works, R. H. Grant, superintendent; John J. Grant, general manager; have been established at Fitchburg, Mass., occupying a building 100 x 30, with an annex for boiler and engine room. They are preparing to manufacture steel balls for antifriction purposes, and will soon bring out a high-speed grindstone frame and other specialties. Eventually a general line of machine tools will be produced.

The new plant of the St. Lawrence Mfg. Company, just erected at Irondale, Col., with its entire machinery and stock, has been destroyed by fire. The loss exceeds $30,000, while the insurance is only one-third that amount.

The citizens of Woodstock, Ont., have granted a bonus of $25,000 and ten years' exemption from taxes to the firm of John Stewart & Co., iron founders, of Hamilton, Ont., in consideration of the company establishing their works at Woodstock. A section of the Ontario statutes provides that no bonus shall be granted by any municipality to secure the removal thereto of any industry already established elsewhere in the province. Despite the apparent illegality of the bonus, however, the offer has been accepted.

The foundry and pattern shop of George S. Mesker, at Evansville, Ind., have been burned, entailing a loss of $40,000.

The American Engineering Company of Jersey City, N. J., capitalized at $1,000,000, have been incorporated. The object of the concern is the construction of steam and electric power plants, and the manufacture of machinery.

Hardware.

The Hartman Mfg. Company of Beaver Falls, Pa., manufacturers of wire netting and fencing, recently shipped a carload of fencing to Omaha. A number of new machines are being placed in the plant of this firm, which will considerably increase its capacity.

The Covert Mfg. Company of West Troy, N. Y., report that they have for the past two years enjoyed a success that is phenomenal, their business having so increased that their works are taxed to their full capacity. They have a number of valuable newly patented articles to put upon the market, but the great demand for their old line of goods renders it impossible for them at present to properly introduce anything new. Mr. J. C. Covert has just returned from purchasing new machinery in New York, and greater facilities will soon be added to their already extensive plant.

Edward S. Hotchkiss, Bridgeport, Conn., manufactorer of hardware specialties, has recently moved to a commodious new building situated at the corner of South avenue and Walnut street, Bridgeport. The building is of brick, four stories high, and covers ground 240 x 55 feet. It is thoroughly constructed, and is equipped with improved machinery and appliances, including an electric light plant. In addition to the building above described, the premises of the old firm of Hotchkiss' Sons Mfg. Company, established in 1840, whose business has been bought by E. S. Hotchkiss, will be occupied by the latter. A number of new lines, including curry combs, game traps, horse and toilet clippers and wood choker mouse traps, have been added to the well-known Hotchkiss specialties.

John A. Miller, St. Louis, Mo., manufacturer of Miller's Vehicle and Ratchet Wrench, has just returned from a trip to Cincinnati, where he visited leading jobbers, and succeeded in securing a number of desirable orders for his new patented wrench. Carrriage manufacturers are reported to be adopting this wrench in preference to others, and the demand from this source alone is said to be sufficient to keep him comfortably employed.

The Peerless Matting Company of Rochester, Pa., made their first shipment of wire and matting last week to Sacramento, Cal.

Coldwell Lawn Mower Company, Newburg, N. Y., the organization of which was mentioned and the names of the officers given in our issue of the 15th inst., have begun the construction of a new factory suitable for their business. It is to be 150 x 50 feet, three stories high, and will have a capacity of from 150 to 200 mowers a day. Lawn rakes, brush machinery and smoked-beef cutters will also be manufactured, but lawn mowers will be the principal product. Application has already been made for four or five new patents, covering over 25 new inventions on lawn mowers, beef cutters and other implements. Temporary quarters have been secured to use until the new factory is completed. Machinery will be set up at once, and it is expected that in three or four weeks the works will be in actual operation. The present plant is arranged to turn out about 100 machines daily ; thus the company will be ready for the coming year's business. It is proposed by this company to make only first-class machines, in which will be embodied all the best ideas resulting from the experience of a quarter of a century in the lawn-mower business.

The J. C. Russell Shovel Company of Pittsburgh, Pa., have been granted a charter, with a capital stock of $50,000. The incorporators are Jas. C. Russell, Jno. J. McKee, W. R. Snyder, of Pittsburgh; Albert Wettendell of Chartiers Township and Alex. Morrison of Beaver Falls, Pa.

Miscellaneous.

The National Reaper and Mower Company, of Canton, Ohio, propose to remove their plant to Latrobe, Pa., providing a site of 10 acres is donated and $28,000 worth of stock subscribed. The Latrobe Land and Improvement Company have indicated their willingness to take $10,000 worth of this stock, and an effort is now being made to have the citizens of Latrobe subscribe for the remainder.

The Shultz Belting Company, St. Louis, Mo., have filed affidavit of increase of capital stock from $300,000 to $500,000.

The Kidd Steel Wire Company, now operating temporarily at Harmersville, Pa., have purchased the Bollman Works at Sharpsburg, and will manufacture fine steel and dentists' drills.

The Oil Well Supply Company's pipe mill at Frankstown, Pa., has shut down, owing to the strike of the pipe cutters, who demanded an increase of 10 cents a hundred.

The Northwestern Expanded Metal Company now have their new factory in smooth running order at Twenty-sixth street and Stewart avenue, Chicago. The building is 128 x 120 feet, one story high, substantially built of brick and lighted from both the roof and sides. Four ponderous machines are in steady operation cutting steel sheets into expanded metal to be sold in competition with woven wire. These machines turn out metal up to 2½-inch mesh. Their product at present is mainly used for lathing. The company have taken large contracts for furnishing lathing for exterior as well as interior work on buildings for the World's Fair, which will keep not only these works but factories at St. Louis and Pittsburgh busy for nearly a year. This style of lathing is being specified for partitions by numerous architects, and has been adopted in several large Chicago buildings. The World's Fair contracts are expected to give a decided impetus to the use of this style of construction in the erection of dwelling houses, as it is estimated that the cost of houses constructed of balloon frame with an exterior of metal lathing and a surface of adamantine plaster is but 20 per cent. more than if built of wood entirely. The company are doing a large business in fencing as well as in lathing. They are also turning out considerable work in the line of window guards, office railings, &c., and have firmly established expanded metal on a substantial commercial footing in the Northwest.

Licenses to incorporate under the laws of Illinois have been issued to the following: The Phœnix Wrench Mfg. Company, at Chicago; capital stock, $300,000; for the manufacture of hardware specialties; incorporators, E. L. Pickard, Chapman Seabury, F. M. Bradwell and D. R. Porter. The Connecticut Smokeless Fuel Gas Company, at Chicago; to manufacture gas, electricity, &c.; capital stock, $1,500,000; incorporators, T. G. Hall, Luke T. Drury and C. C. March. The Haish Mfg. Company, at De Kalb; to manufacture fence wire; capital stock, $100,000; incorporators, Jacob Haish, Charles H. Salisbury and S. P. Bradshaw.

The Snead & Co. Iron Works, through their Chicago manager, C. W. Trowbridge, have taken a contract amounting to $104,900 for the ornamental iron work in the new Masonic Temple of Chicago. Some of the work will be Bower-Barffed, but it will consist principally of electro-bronze. The designs are original, and many of them are exceedingly handsome. The company have in hand a contract amounting to $106,000 for the book cases of the new Congressional Library Building in Washington. With this exception the Masonic Temple order is the largest that has been placed in the country for ornamental iron work the present year.

The plant of the Jones Car Company, at West Troy, N. Y., is to be increased by a large addition. This will double the capacity of the works, which are now overtaxed. The new plant will be in readiness for use by spring.

A new industry has been started in Elkland, Tioga County, N. Y.. for the manufacture of mattresses, upholstering and carriage trimming.

The Cortland Wagon Company of Cortland, N. Y., are constructing a new plant. It will be a three-story brick building of what is known as the slow-burning mill construction, flat roof, covered with tin. Its estimated cost approximates $10,000. The building is to be used for storage and will insure regular work for nearly a full force of hands. With this the company can prepare all winter for spring trade. There will be 36,300 square feet for storage purposes, which will accommodate over 1000 finished wagons or over 2500 wagons if packed in parts.

Schleicher, Schumm & Co. of Philadelphia write us that their German correspondents have informed them that at the Strasburg Industrial Exposition, where an unusually large number of gas engines of all makes and descriptions were exhibited, they alone were awarded for their Otto gas, gasoline and petroleum engines the highest diploma and gold medal for superior design and workmanship. Second prizes were given to Adam, Benz, Buss-Sombart & Co., Hille; the Kobers Iron Works, Escher-Wyss & Co. Third prizes to Grob & Co. (Capitaine petroleum motor), Korting & Bitschweiller (petroleum motor).

The Bath Iron Works of Bath, Maine, have contracted with the Portland and Machias Steamship Company for a large side-wheel passenger steamer, to be completed June 1 of next year.

PERSONAL.

C. Hay, of the well-known firm of Naylor, Benzon & Co., London, is now in this country.

Last week we erroneously referred to B. G. Clarke as president of the Lackawanna Iron and Steel Company. E. Hatfield has occupied that post for years.

Andrew Wheeler of Philadelphia, treasurer of the American Iron and Steel Association, has recently returned from a few weeks' pleasure trip through Europe. During his tour Mr. Wheeler visited England, France, Germany, Austria and Italy.

Andrew Carnegie and George Lauder of Pittsburgh appear to have been the only Americans who took an active part at the meeting of the Iron and Steel Institute in London. Mr. Carnegie at the banquet made a brief speech advocating the federation of the whole English-speaking race, while George Lauder took part in the discussion of the paper on the Hoerde process, dealing chiefly with the practice at the Edgar Thomson works as developed by the introduction of the Jones mixer.

The Blandon Rolling Mill Company, Limited, at Blandon, Berks County, Pa., have made an assignment. The particulars have not been made public, but it is believed that the assets are more than double the liabilities. The Blandon mill was built in 1867, and enlarged and improved in 1880 and 1887. It has ten single puddling furnaces, three heating furnaces and three trains of rolls. The product was merchant bars, horseshoe iron, and hoop, band and skelp iron. The annual capacity of the mill was about 10,000 net tons. A New York office was located at 112 John street.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 20, 1891.

The condition of the Iron trade has not shown any very decided change during the past week, and what little there is is not in the direction of improvement. There is no loss of faith in regard to the ultimate outcome, but as regards immediate business much disappointment is expressed. One reason, perhaps, for the indifference of buyers is because of the premature increase of production, leading to an apparent oversupply, especially in Pig Iron. Nothing chills the ardor of buyers more than to meet with sellers who are willing to shade a trifle so as to secure immediate business. It makes no real difference as regards consumption, but in the meanwhile it checks sales, and imparts a feeling of apathy which is not always warranted by the actual facts. This appears to be the condition of things to-day, sellers being a little more anxious than they were a week ago, while with prices somewhat easier consumers are disposed to defer placing large orders until the season is further advanced, or until something occurs to suggest a movement toward higher prices.

Pig Iron.—There is a good deal of business doing in one way or another, but the feeling is unsettled and not as firm as it was two or three weeks ago. The very large production and the expected "blowing in" of additional furnaces has had a depressing influence, so that, unless for material actually required, there is not much disposition to place orders. At the same time there does not appear to be any special weakness in prices, although business is urgently sought for at about the figures recently ruling. In some instances buyers are willing to place orders on these terms for their favorite brands, but they require deliveries to extend over the first quarter of 1891, which is not what makers expected some time ago. The general idea was for higher prices after the turn of the year (or before), but that vision is gradually fading away, and for the present makers have all they can do to realize on their output and maintain quotations as given during the past few weeks. On the whole, it is probable that the market will be pretty well tested before the close of the year—first, because of the large increase in production, and, second, because consumers are less inclined to take a sanguine view of the future, and are, therefore, limiting their orders, or standing out for concessions. There is a possibility, however, that the market may yet take a sudden start upward, as there is no reason for assuming that the conditions are less favorable than before. On the contrary, everything that was supposed to be favorable has been confirmed, while nothing to the contrary has been developed unless it may be a somewhat premature increase in production. For the present sales are usually at about the following prices, varying with brand, quantity, and the time and point of delivery:

Ohio Softeners, No. 1x	$19.00	@	.....
Ohio Softeners, No. 2x	18.00	@	.....
Standard Penna. No. 1x	17 75	@	$18.00
Standard Penna. No. 2x	16 25	@	16 50
Medium Penna No. 1x	17 25	@	17 50
Medium Penna. No. 2x	16 00	@	16.25
Virginia, No. 1x	17 00	@	17 25
Virginia, No. 2x	15 75	@	16 00
Standard Neutral All-Ore Forge	14 25	@	14 75
Ordinary Forge Cinder mixed	13 50	@	14 00
Hot-Blast Charcoal	20.00	@	22.00
Cold-Blast Charcoal	24.00	@	27.00

Ferromanganese—Several sales are said to have been made during the past week, but it is difficult to find out any particulars. Importers ask $64.50, duty paid, for 80 %, but it is supposed that $64 or less was accepted for the lots just sold.

Steel Rails.—There is nothing doing except in small and medium sized lots, for which $30, at mills, is quoted. Buyers seem in no hurry to place orders, although they may be taking some risks by the delay. In any event there is hardly any chance for lower prices, while the possibilities in the other direction are quite numerous. Be that as it may, neither buyers nor sellers show any inclination to change their position, so that the deadlock may continue until circumstance compel one side or the other to give way.

Steel Billets.—There is very little business offering at present, large consumers having pretty well provided for their requirements during the balance of the year. Bids at current prices could be had for deliveries during the first quarter of the coming year, but manufacturers are not inclined to accept business of that kind, unless at from 25¢ to 50¢ ₱ ton advance. The consequence is a "stand off" on both sides, with occasional sales at about $27.25 at Schuylkill Valley points, or $26.75 for the Susquehanna district. For prompt specifications something better than that could probably be done, but business of that kind is rather scarce at the moment.

Muck Bars.—The market is extremely dull and only a few small sales are reported at about $26.50, delivered. Some holders ask more money, but there is very little demand, even at the low figure named.

Bar Iron.—There is little or no change to report in this department, and the trade generally are, like Micawber, "waiting for something to turn up." Presumably something will turn up before long, but at the moment there is nothing definite that can be pointed to as likely to bring about such a desirable consummation. Mills are running moderately full, but it is chiefly on small orders, which, being somewhat precarious, causes sharp competition on any new business that may be offered. Sales are chiefly at 1.70¢ @ 1.75¢ for carload lots, city deliveries, or 1.60¢ @ 1.65¢ at interior points, but a good deal depends on quality, quantity and character and date of specification.

Skelp Iron.—No demand of any importance, so that prices are nominal at 1.70¢ @ 1.75¢. delivered, for Grooved Skelp, or 1.85¢ @ 1.90¢ for Sheared.

Plates.—There is a fair inquiry for Plates of every description, but competition is so sharp that prices have no chance for improvement. Boiler work continues to be quite active, bridge work fairly so, in addition to which there is some inquiry from shipbuilders, but as we said before, prices are terribly low. Mills are running moderately full, but it requires constant vigilance to maintain that position, and until they accumulate something ahead prices are not likely to show much improvement. Nominally quotations, delivered, are about as follows, but concessions of from $\frac{1}{10}$¢ to $\frac{1}{10}$¢ are quite common, especially on Steel, and more than that on what are supposed to be the higher qualities:

	Iron.	Steel.
Tank Plates	1.90 @ 2.00¢	2.00 @ 2.10¢
Refined	2.20 @ 2.30¢	2.10 @ 2.20¢
Shell	2.30 @ 2.40¢	2.40 @ 2.50¢
Flange	3.20 @ 3.30¢	2.50 @ 2.75¢
Fire-Box	4.00 @ 4.25¢	3.00 @ 3.50¢

Structural Material—There is no special change from last week, although some of the mills appear to be quite actively employed. There is a fair amount of new business coming in from time to time, but nothing important, although the daily papers have it that work on the North Eastern Elevated Road, in Philadelphia, is to be commenced this week. This, however, is like a great many other contracts—contingent upon the money being raised. The Phœnix Iron Company have agreed to build the road at a certain price, and that price has been accepted by the incorporators, but a good deal of financing has to be done before work is actually commenced. Ultimately there is no doubt that the road will be built, but it will be an agreeable surprise if it is commenced this year, or next year, either, unless money becomes easier. Meanwhile quotations are unchanged, as follows: Angles, 1.95¢ @ 2.05¢; Sheared Plates, 1.90¢ @ 2¢, and in some cases about $\frac{1}{10}$¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—There is a pretty fair although an irregular demand for Sheets, some mills being quite full of orders while others report an accumulation of stock, particularly in the higher numbers. Prices are unchanged and for the best makes are quoted as follows:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.10¢ @ 3.15¢
Best Refined, Nos. 25 to 26	3.20¢ @ 3.30¢
Best Refined, No. 27	3.40¢ @ .....
Best Refined, No. 28	3.50¢ @ .....
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¢ @ 3¼¢
Best Soft Steel, Nos. 21 to 24	3¼¢ @ ....
Best Soft Steel, Nos. 25 to 26	3¾¢ @ ....
Best Soft Steel, Nos. 27 to 28	4¢ @ ....
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount	@ 67½ %
Common, discount	@ 70 %

Old Material.—The market is extremely dull, and prices are fractionally lower. Good stock commands pretty well up to quoted rates, but other descriptions, or anything pressed for sale, can only be placed by making concessions. The usual asking prices are about as follows: Iron Rails, $21 @ $22.50; Steel Rails, $17 @ $18, delivered; No. 1 Railroad Scrap, $20.50 @ $21, Philadelphia, or for deliveries at mills in the interior $21 @ $21.50, according to distance and quality; $14.50 @ $15.50 for No. 2 Light; $13.50 @ $14.50 for best Machinery Scrap; $13.50 @ $14 for ordinary; $14.50 @ $15.50 for Wrought Turnings; $9.50 @ $10.50 for Cast Borings, and nominally $23 @ $25 for Old Fish Plates, and $16 @ $16.50, delivered, for Old Car Wheels.

Wrought-Iron Pipe.—The feeling is a little steadier in Pipe, and, although there is still some irregularity, it is believed that firmer prices are almost within sight. For the present discounts are supposed to be as follows:

Butt-Welded Black	57½ %
Butt-Welded Galvanized	47½ %
Lap-Welded Black	67½ %
Lap-Welded Galvanized	55 %
Boiler Tubes, 2½ inch and under	52½ %
Boiler Tubes, 3 to 6 inch	60 %
Boiler Tubes, 7 inch and larger	55 %

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, October 21, 1891.

There continues to be a confident undertone to the market, but with a smaller volume of business. The sales for the week were mainly for current consumption running the remainder of the year, or the first month in next year, in one to five carload lots, and on the basis of $10 at the furnace for Gray Forge and $10.50 for No. 3 Foundry. These are the prices prevailing for deliveries running up to and including next June, but it is difficult to buy much for March delivery at this price, because the furnaces are well sold up, while it is comparatively easy to obtain Iron for June, although there are some furnaces that will not make a price so far in the future. Tennessee and Alabama

Charcoal Iron is less urgently offered, and most, if not all, furnaces are asking an advance, some of them more than quotations. Lake Superior Car Wheel Iron is also higher in this market, although the transactions are not large. There has been nothing of importance developed in regard to consumption, but there are indications that it is keeping well up to the increased production, the recent enlargement being maintained, and in some cases still further increased. There are inquiries for some round lots of Gray Forge Iron for delivery next spring, which are in process of negotiation and may be completed at an early day. There is less complaint of the backwardness of collections, but they are not as yet made as promptly as seems desirable, although money in this market is reasonably plenty and easy. We quote as follows:

Foundry.

Southern Coke, No. 1	$15.25 @ $15.75
Southern Coke, No. 2	14.00 @ 14.50
Southern Coke, No. 3	13.25 @ 13.50
Ohio Soft Stone Coal, No. 1	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2	15.50 @ 16.50
Mahoning and Shenango Valley	17.00 @ 17.50
Hanging Rock Charcoal, No. 1	20.00 @ 21.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00

Forge.

Gray Forge	12.75 @ 13.00
Mottled Neutral Coke	12.25 @ 12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	19.25 @ 19.75
Hanging Rock, Cold Blast	25.00 @ 26.00
Lake Superior Car Wheel and Malleable	18.75 @ 19.25

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 21, 1891.

The situation is extremely disappointing to the Iron interests in this locality. The demand falls considerably short of expectations. Dealers who stocked up in anticipation of a heavy fall trade are looking forward to a dull period instead, which is not only annoying, but almost exasperating in view of the favorable conditions found in other lines of trade. The belief is universal that better times are at hand, but everybody is anxiously inquiring when. The Calumet Iron and Steel Company shut down their rolling mill on Saturday and will not resume operations until the market improves and a profit can be seen in the manufacture of Bar Iron. Orders are floating about for some 10,000 cars, but they are not being placed rapidly. The whole Iron market has an air of dullness and languor which is very unusual at this season.

Pig Iron.—Several contracts for local Coke which have been pending for some time were placed the past week, and there have been some fair sized sales of Southern, but consumers now appear to have covered their requirements for the time, and a quiet period is expected to follow. Inquiries are being made for deliveries extending far into next year, but makers are not inclined to make contracts of such a character at present prices. Soft and strong Ohio Coke Irons are in good demand in small lots, and this class of Iron is being taken in promptly by buyers, but there is some complaint over requests for postponed deliveries of ordinary grades. Prices are about as they have been, the heavy transactions of the past two months failing to stiffen the market. Southern Gray Forge, however, seems inclined to weakness, stocks of that grade evidently accumulating at some furnaces. Lake Superior Charcoal is irregular, but the concessions now being made are on brands which are comparatively new, and have a reputation to make. Sales are reported of old and well-established brands at full quotations. Some buying is being done by Car-Wheel makers. Texas Charcoal Pig Iron has made its appearance here in competition with Alabama Car-Wheel Irons. Large sales have been made at St. Louis and in Central Illinois. Quotations are as follows, f.o.b. Chicago:

Lake Superior Charcoal	$17.00 @ $17.50
Local Coke Foundry, No. 1	15.50 @ 16.00
Local Coke Foundry, No. 2	15.00 @ 15.25
Local Coke Foundry, No. 3	14.50 @ 15.00
Local Scotch	16.00 @ 16.50
Ohio Strong Softeners	17.75 @ 18.25
Southern Coke, No. 1	15.75 @ 16.25
Southern Coke, No. 2	15.00 @ 15.25
Southern Coke, No. 3	14.25 @ 14.50
Southern, No. 1, Soft	15.00 @ 15.75
Southern, No. 2, Soft	14.50 @ 14.75
Southern Gray Forge	14.00 @ ....
Southern Mottled	13.50 @ 14.00
Tennessee Charcoal, No 1	18.00 @ ....
Alabama Car Wheel	20.50 @ 21.50
Coke Bessemer	.... @ ....
Hocking Valley, No. 1	17.00 @ 18.50
Jackson County Silvery	17.50 @ 18.00

Spiegel—Is quiet and unchanged.

Bar Iron.—The demand is only moderate. A few car orders have been taken and some business has been done with implement works, but trade in general is rather quiet. The Mahoning Valley mills are again a very important factor here by reason of the stoppage of the local mills. Prices range from 1.75¢ to 1.80¢, according to the character of the order.

Structural Iron.—Contracts for several large buildings will shortly be in the market, but business has been quiet in this line for some little time. More buildings are in sight at St. Louis than here. Prices have not advanced.

Plates.—The principal demand just now is for tank work. The boiler plate trade is dull, mill orders are very scarce, and about everything in sight seems to have been cleaned up. Prices are unchanged.

Sheets.—Sales of 27 Common Black have been made by mills at 2.95¢, Chicago. Jobbers are having a good demand at 3.20¢ for No. 27. Galvanized Iron is moving very briskly and standard sizes are not to be had from either manufacturers or jobbers. Prices are firmer, and although 60 and 10 % is still quoted on Juniata, it is a bottom price from stock.

Merchant Steel.—Renewed inquiry is noted from the implement trade. Some are belated purchasers, but others are making supplemental contracts for Spring and Machinery Steel. The car builders are also ordering to some extent. Prices of cheap Steel are ruling as last reported, but Tool Steel is again the subject of competition between some of the local sellers.

Track Supplies.—Manufacturers are booking orders for Steel Rails in moderate amounts, but thus far no business has been done for winter delivery. Inquiries for next year are coming forward, but sellers are not yet ready to close. The manufacturers here hope to keep at least one Rail mill running through the winter with, of course, the customary stop in December for repairs. Prospects for the future are bright and prices are firm with an upward tendency. An error in last week's quotations appeared. Figures should have been $31.50 @ $33. Splice Bars are quoted 1.85¢; Track Bolts, Hexagon Nuts, 2.75¢; Spikes, 2.20¢ @ 2.25¢.

Old Rails and Wheels.—Sales are reported of Old Iron Rails in several lots, aggregating some 2500 tons, equivalent to $22.25, Chicago. The market is weak. Old Steel Rails are nominally worth $14 @ $16, but very little doing. Old Car Wheels are in fair demand at $16 @ $16.25.

Scrap.—The outlook is very blue for both Forge and Mill Scrap now that the local rolling mills have shut down. These are the worst times seen in this branch of trade for years. Cast Scrap shows some little life, however, and Steel is also selling in a small way. Quotations are unchanged because nothing has yet turned up to establish a new basis of values Dealers quote selling prices ℔ net ton: No. 1 Railroad Forge, $19; No. 1 Forge, $18; No. 1 Mill, $13.50; Fish Plates, $21.50; Car Axles, $23.50; Horse Shoes, $18.50; Light Iron, $8.50; Machinery Cast, $12 @ $12.25; Stove Plate, $8.50; Cast Borings, $7 @ $7.25; Wrought Turnings, $9.50 @ $10; Axle Turnings, $12.50; Mixed Steel, $10.50; Coil Steel, $14; Leaf Steel, $15; Tires, $15.50; Malleable Cast Scrap, $9.50.

Metals.—Lake Copper is now quoted 12¾¢ in carload lots, and casting brands 12¢ @ 12¼¢. Spelter is steady at 4.85¢ @ 4.90¢ for prime Western. The Lead market has been quiet, with carload sales at about 4¢ @ 4.25¢

St. Louis.

Office of *The Iron Age*, 214 N. Sixth st., ST. LOUIS, October 19, 1891.

Pig Iron.—There is no special change to note. Sales during the past week will foot up a very satisfactory business, and prices are, on the whole, well maintained. General business is in good shape, and while no extraordinary movement in Pig Iron is anticipated, a steadily improving market is expected from this time on. Car works are running full time and have recently purchased quite freely, and are at present entirely out of the market, so far as buying is concerned. The railroads are closely watched, as it is expected that any upward movement will be initiated by them, when they are ready to place their orders for material, and which it is thought will shortly be done. With the railroads in the market as buyers a general improvement is looked for along the entire line, and unless they are heard from very shortly, prices are likely to ease off somewhat. There is still considerable snap in the market, which promises to carry it over the period between now and January 1, after which it is thought all will be plain sailing. For prompt shipment we quote as follows, f.o.b. cars, St. Louis:

Southern Coke, No. 1 Foundry	$15.50 @ $15.75
Southern Coke, No. 2 Foundry	14.50 @ 14.75
Southern Coke, No. 3 Foundry	13.75 @ 14.00
Gray Forge	13.25 @ 13.50
Southern Charcoal, No. 1 Foundry	17.25 @ 17.75
Southern Charcoal, No. 2 Foundry	16.75 @ 17.25
Missouri Charcoal, No. 1 Foundry	15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry	15.00 @ 15.50
Ohio Softeners	17.75 @ 18.75

Bar Iron.—Mills are running full time and at prices that are more satisfactory to them than for some months past. Jobbers are buying freely and the local demand from railroads is steady. We quote as follows: Car lots, from mill, 1.72½¢ @ 1.77½¢, small lots, from store, 1.85¢ @ 1.90¢, according to quantity.

Barb Wire.—Mills are kept fairly well employed considering the lateness of the season. The prices recently adopted continue unchanged, as follows: Painted, 2.70¢; Galvanized, 3.20¢; terms, 60 days or 3 % discount for cash in ten days.

Wire Nails.—A fairly steady trade is reported. Prices however are considerably mixed and some jobbers claim to have bought nails at very low prices, much lower than the mills admit they have sold. The following prices indicate the condition of the market: Carload lots, from mill, $2 @ $2.05, jobbers ask from $2.15 @ $2.20 for small lots from store.

(By Telegraph.)

Pig Lead.—The market has sagged badly during the past week and sales have been made at 4.10¢, 150 tons changing hands to-day at that figure. The market

appears to be scraping bottom, but as it appeared much the same way when 4.30¢ was the ruling price, it is difficult to say what the outcome will be. Offerings are free at 4.10¢, but consumers appear unwilling to venture in even at this low figure. It is possible that 4¢ will be reached unless consumers come to the rescue. Spelter has acted in sympathy with lead and sales have been made at 4.65¢ for delivery during the next 60 days. Sellers are offering to accept orders for delivery during the 12 months of next year at 4.75¢, which is in itself a strong indication of a weakness which will no doubt make itself felt in a more forcible manner before long. Sales have been limited and consumers are not in the market; in fact, some are asking that their regular shipments be held until further notice. The prospect for higher prices is not encouraging and as production is considerably in excess of consumption it is difficult to see where any early improvement can come in.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, October, 18 1891.

Pig Iron.—No improvement either in demand or price. As a rule consumers are refusing to buy beyond immediate actual wants; hence there is a light volume of business, and until there is some evidence of an advance it is not likely that they will depart from the hand-to-mouth policy. Consumption continues large, but so is production, and the fact that the visible supply is reported as showing an increase, proves the latter to be in excess of the former. Furnacemen in the Shenango and Mahoning valleys continue to report that they can do better at home than in this market, and others interested in furnace property east of Pittsburgh report that they can do better in Philadelphia than here. Southern Iron cannot be sold here at present prices, and it is very evident that the local furnacemen have the local market well in hand, but it is claimed that they are not making any money, that present prices afford no margin for profit. Furnace owners generally looked for an improvement this month, both as to demand and price, but thus far their expectations have not been realized, and the outlook is not any better than it has been. The great trouble just now in the West is an overproduction; the 26 furnaces in this county are turning out from 5000 to 6000 tons per day for seven days in the week. Prices remain about as a week ago:

Neutral Gray Forge	$13.75 @ $13.85,	cash.
White and Mottled	13.00 @ 13.25,	"
All-Ore Mill	14.25 @ 14.50,	"
No. 1 Foundry	16.25 @ 16.50,	"
No. 2 Foundry	15.00 @ 15.50,	"
No. 3 Foundry	14.50 @ 15.00,	"
No. 1 Charcoal Foundry	21.50 @ 22.00,	"
No. 2 Charcoal Foundry	20.50 @ 21.00,	"
Cold-Blast Charcoal	25.00 @ 27.00,	"
Bessemer Iron	15.50 @ 15.75,	"

So far as we can learn there have been no sales of standard Bessemer below $15.50, cash, and some furnacemen are refusing to sell at that price, unless for prompt delivery. Sale of an off lot was reported at $15, cash. Valley furnacemen aver that they can get $15, cash, f.o.b. at their furnaces, which is equal to $15 70, Pittsburgh. But few furnacemen here would care to contract either for Mill or Bessemer for future delivery at present prices. The fact that three big firms here have asked for an extension within the past couple of months has not been without its effect upon the local market.

Muck Bar—Continues neglected, and the outlook for an improvement in demand is not very encouraging; there is not the demand usual at this time of the year. Prices remain about the same as last quoted, ranging from $26.25 to $26.75, cash, as to quality or delivery; most of the business appears to be at $26.25 @ $26.50.

Manufactured Iron.—There is a continued good demand for Bar Iron, and mills making a specialty of the same, both here and in the Shenango and Mahoning valleys, have all they can do. However, there is not as much new business as there was a few weeks ago. Prices are still quoted at 1.60¢ @ 1.65¢ at valley mills and 1.70¢ @ 1.75¢ here in Pittsburgh. A number of the valley mills are using Old Rails, and a good many buyers do not take kindly to "Old Rail Iron" and are willing to pay more for that made from strong neutral Muck Bar. Tank and Plate Iron still quoted at 2.05¢ @ 2.10¢, with a fair demand. No. 24 Sheet remains unchanged at 2.75¢, all 60 days, 2 % off for cash. Skelp Iron continues dull for the season of the year. This time last year the mills were scarcely able to meet the demands made upon them. Grooved Skelp is still quoted at 1.70¢ @ 1.72½¢ and Sheared do. at 1.85¢ @ 1.90¢, four months, 2 % off for cash.

Nails.—There is a continued fair demand reported for Cut Nails, but no change in prices, $1.60 for 30¢ average, f.o.b. at factory, 60 days, 2 % off for cash. In regard to Wire Nails there is no improvement to report. Manufacturers complain more of prices than demand. Orders are now being taken for immediate or near-by delivery at $1.80, 60 days, 2 % off for cash, f.o.b. at factory, and it is said that the price quoted affords the manufacturer very little, if any, margin for profit. So far as the manufacturer is concerned, the Wire Nail is not much, if any, better than the Cut Nail.

Wrought-Iron Pipe.—There is a fair volume of business, but no improvement in prices, which are irregular and unsatisfactory; the syndicate rates are being cut more or less, and it is hard to maintain prices when trade is poor. There is no trouble in holding prices when the mills have all they can do, as they had a year ago.

Structural Material.—The activity in this line noted for some weeks past continues, and while there has been no general advance as yet some of our manufacturers have within the past week realized $1 more on some kinds of material which is in scant supply and wanted for immediate or nearby delivery. A general advance soon is not improbable. Beams and Channels, 3.10¢; Steel Sheared Bridge Plates, 2.15¢ @ 2.20¢; Angles, 2¢; Tees, 2.60¢; Universal Mill Plates, Iron, 2¢ @ 2.05¢; Refined Bars, 1.80¢ @ 1.85¢.

Steel Plates.—There has been a very fair demand the past week and prices are firmer, but are unchanged: Fire Box, 3.85¢ @ 4.25¢; Tank, 2.05¢ @ 2.10¢; Shell, 2.75¢; Flange, 2.40¢ @ 2.50¢.

Merchant Steel.—There is a very fair business; some of our manufacturers report having about all they can do. No change in prices: Crucible Tool Steel, 6½¢ @ 7¢; do. Spring Steel, 4¢; do. Machinery, 4½¢ @ 5¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Tire Steel, 2.20¢; Toe Calk, 2.40¢ @ 2.50¢; Steel Bars, 1.80¢ @ 1.85¢.

Barb Wire—Is still quoted at $3 for Galvanized and $2.50 for Painted, in car lots and upward at factory, and 5¢ additional for less than a carload. The committee appointed at a meeting of the creditors of Oliver & Roberts have reported in favor of granting the extension asked for by the firm.

Wire Rods—Are a shade weaker, sales having been reported during the week at $34.50, cash, at makers' mill. Some manufacturers still quote at $35, and say they will not accept less. There is a fair demand.

Billets and Slabs.—There is a continued fair demand for Billets, with most of the business reported at $25, cash, at makers' mill; small lots at $25.25 @ $25.50. The mills, both here and at Wheeling, are pretty well sold up. Sales reported below our inside quotation are looked upon by manufacturers with more or less suspicion.

Old Rails.—There is a continued good demand for Iron Rails, mostly from valley districts, with sales of Iron Rails at $23.50 @ $24, and Steel at $17.50 @ $18.50 for short and long pieces.

Railway Track Supplies.—Demand is good, but no change in prices. Spikes, 2.10¢ @ 2.15¢, 30 days, f.o.b. at makers' works; Splice Bars, 1.75¢ @ 1.85¢; Track Bolts, 2.70¢ with Square and 2.80¢ with Hexagon Nuts.

Steel Rails.—Demand steady, although no large contracts have been reported recently. Price remains unchanged at $30, f.o.b. at mill.

Ferromanganese—Is firmer, with sales of domestic 80 % reported at $66.50 @ $66.90, cash.

Old Material.—There is a fair demand for No. 1 Wrought Scrap, with sales at $19.50, net ton. Some few small sales of Hammered Iron Axles have been made recently at $28, net ton, for a special purpose, but around lot to a mill could not probably be sold above $25 or $26. Sales Cast Scrap at $13.50, gross; Leaf Spring Steel, $20, gross; Steel Bloom Ends, $18, gross.

Connellsville Coke.—There is a fair business at unchanged prices.

The old commission Iron firm of Nimick & Co. has been succeeded by that of John S. Slagel & Co. The members of the new firm consist of John S. Slagel and Geo. P. McBride, both of whom were members of the firm of Nimick & Co. for many years.

Carnegie, Phipps & Co., Limited, have opened a Southern office to take charge of their Southern trade, with headquarters at Atlanta, Ga., and placed it in charge of Walter M. Kelly. In addition to representing the above firm, Mr. Kelly will also represent Carnegie Bros. & Co., Limited, in the sale of Edgar Thomson rails and Duquesne billets.

Louisville.

LOUISVILLE, KY., October 19, 1891.

Pig Iron.—There have been large blocks of Car-Wheel Iron sold during the past week to consumers, one company buying 5000 tons and paying spot cash, permitting the Iron to be delivered at once. Owing to heavy sales during the past 60 days, the large stocks of Charcoal Irons have been nearly closed out, and it is felt that any further demand will cause an advance in price. Purchasers of Coke Iron find prices stronger, and where deliveries are for next year $11.50 is asked for No. 2 Foundry, especially where shipments will not begin until January; sales have also been made upon this basis and inside figures are $11.25. There is great confidence felt by both producers and consumers that consumption will continue very heavy during the coming year and that the tendency will be toward higher prices, though it is expected that the market will advance slowly. Cars are becoming scarce in the Southern district, and it is especially difficult to get shipments to

Eastern points, there now being a blockade at Savannah. With the approaching shipment of cotton it is expected that the shortage of cars will be greater than ever before, and that it will be wise for consumers to carry unusually heavy stocks of Iron during the fall. We quote for cash, cars, Louisville, Ky:

Southern Coke, No. 1 Foundry	$14.50 @ $15.00
Southern Coke, No. 2 Foundry	13.75 @ 14.25
Southern Coke, No. 3 Foundry	13.25 @ 13.75
Southern Coke, Gray Forge	12.75 @ 13.25
Southern Charcoal, No. 1 Foundry	16.00 @ 17.00
Southern Car Wheel	18.50 @ 20.00

Geo. H. Hull & Co., Louisville, Ky., have been appointed exclusive Western and Southern agents for the sale of the Jenifer Iron.

Cleveland.

CLEVELAND, October 19, 1891.

Iron Ore.—There has been a remarkable falling off in receipts of new Ore at Lake Erie ports during the past week. The activity infused into the market by the great reduction in lake freights has visibly subsided. In fact, no great effort is being made to sell Ore for delivery this year. By quitting business on November 1 the vesselmen get a 20 % rebate on their insurance assessments. This means more to them than a little extra business, extending ahead for two or three weeks at cheap prices for transportation. Only about 30,000 tons of new Ore have been unloaded at Cleveland during the past week, against 70,000 tons for the same week in 1890. The shipments to the furnaces have, however, been heavier. It is apparent that the season will end with only a trifling amount of unsold Ore on the docks. Indeed, the whole purpose of the Ore men seems to be to wind up the season of 1891 with clean balance sheets and begin all over again next spring. The sales made through the Cleveland agencies during the past year are estimated at from 6,500,000 to 7,250,000 tons. Nearly all of this Ore has already been shipped from the mines, and practically all of it will have been unloaded on lower lake docks at the close of navigation. No sales of importance are reported for the week just closed.

Pig Iron.—Dealers confess a certain measure of perplexity over the situation. Consumption seems gradually increasing, but the demand does not improve as many expected—and had reason to expect—it would. We hear of a few sales of Bessemer at $15.75 @ $16, but the amounts involved have been, as a rule, small and unimportant. The furnaces seem busy enough, but inquiries are not keeping up the pace set two or three weeks ago. There is talk of sales of Gray Forge at $13.50 @ $13.75, cash, at the furnace, but it isn't easy to find any particulars. Still, the furnacemen seem never for a moment to relinquish their faith in the ultimate improvement of the market in every way. They say, at least a majority of them do, that at the present rate of consumption better prices cannot be much longer delayed. There does not seem to be much profit in present prices.

Old Rails.—The market is again firm and quite a number of sales have occurred during the past week. A 300-ton lot brought $23.25, and another lot $23.50. It is still asserted that the offerings are in excess of the demand.

Manufactured Iron.—The mills seem to be busy enough to pay indifferent attention to new orders. The demand, however, is so energetic that a good business is assured for the next eight or ten weeks, if, indeed, it does not extend over into the new year.

Scrap.—The demand for No. 1 Railroad Wrought continues fair and $19.50 is about the price per ton; Cast Scrap is quoted at $13.50 @ $14, and Steel Rail and Bloom Ends at $18 @ $18.25.

Nails.—The market has not taken on its anticipated activity and firmness, but these improvements seem to be only temporarily delayed. Steel Wire Nails are still quoted at $2, in stock, with no very large demand; Steel Cut Nails, at $1.70, in stock, seem in better favor than for several weeks past.

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date October 19, 1891, say: While no large purchases of Pig Metal have been made during the past week, there has been an unusually large number of small orders, from carloads to 100 tons, and these coupled with new inquiries for larger amounts which must be shortly placed, shows the market in a very fair condition, as this general demand seems to continue from week to week. Prices have in no way changed, however, although the sanguine sellers are looking for the long expected rise in the very near future. There has been an active purchasing of Manufactured Iron in several directions, notably among the car companies. It would seem as if some of the railroad companies were buying equipment liberally, which heretofore has always meant a decided improvement in the Iron market. Quotations are as follows:

Lake Superior Charcoal, all numbers	$18.00 @ $18.50
Lake Superior Coke, Bessemer	17.75 @ 18.50
Lake Superior Coke Foundry, all ore	17.50 @ 18.00
Ohio Blackband (40 per cent.)	18.00 @ 18.50
Southern No. 1	16.25 @ 16.50
Southern Gray Forge	14.00 @ 14.50
Jackson County (Ohio) Silvery	18.25 @ 18.75

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, October 21, 1891.

American Pig.—The majority of sellers report the market in this section very dull. In the machinery trade manufacturers complain of lack of orders, and, generally speaking, consumers are not sanguine as to the future. There has been some movement in Bessemer Pig, and some large blocks of Cornwall Pig have been placed at low prices for next year's delivery. We understand that one mill has purchased 20,000 tons. We quote Northern brands, $16.75 @ $18 for No. 1; $16 @ $16.50 for No. 2, and $14 @ $14.50 for Gray Forge. Southern Iron sells at $16.25 @ $17 for No. 1; $15.50 @ $16 for No. 2; $14.50 @ $14.75 for No. 3 Foundry, and $14.25 @ $14.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—During the week a lot of 500 tons of 20 % Spiegel has been sold for prompt delivery, before close of navigation, at a low price. There has also been placed a block of 5000 tons German 10 % @ 12 % Spiegel for next year's delivery. Last Thursday a stormy meeting was held in London of the members of the Ferromanganese combination, as the result of which the troubled existence of that association has been ended. Ferromanganese is now being offered at $63.50, tidewater, but the majority of buyers appear to be well supplied. We quote 10 % to 12 %, $23 @ $24; 20 %, $27 @ $28, and 80 % Ferro, $63.50 @ $64.

Billets and Rods.—No business of any consequence is reported in this market, either in foreign or domestic. We quote: Foreign Billets, nominally, $31 @ $31.50, and Domestic Rods $37.50 @ $38, tidewater.

Manufactured Iron and Steel.—The week has been a quiet one, with quotations as follows: Angles, 1.90¢ @ 2.10¢; Sheared Plates, 1.95¢ @ 2.25¢; Tees, 2.45¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 1.95¢ @ 2.15¢ for Tank; 2.20¢ @ 2.30¢ for Shell; 2.45¢ @ 2.65¢ for Flange; 2.65¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2.15¢ @ 2.20¢, delivered. Steel Axles, 2.15¢ @ 2.25¢, and Links and Pins, 2.15¢ @ 2.20¢.

Track Material.—We quote 2.15¢ @ 2.25¢ for Spikes, 1.75¢ @ 1.90¢ for Fish Plates, and 2.80¢ @ 3¢ for Bolts, delivered.

Merchant Steel.—We quote Hot-Rolled Shafting 2.05¢ @ 2.10¢; Machinery, 2.15¢ @ 2.25¢; Tire, 2.20¢ @ 2.25¢, and Toe Calk, 2.25¢ @ 2.30¢, delivered.

Steel Rails.—There has been more activity, and we are able to record sales aggregating 50,000 tons, of which 40,000 tons were taken by Eastern mills, while 10,000 tons went to Pittsburgh. All the sales by Eastern mills have been for renewal on leading roads in New England, New Jersey and Pennsylvania. They include one lot of 6000 tons for a New England road famous for its rigid specifications, in consideration of which the mill receives an advanced price. This order has led to some friction. Some of the mills are now pretty well off for early winter work, and it is evident from the report of the Board of Control either that the works pick up a good deal of business in the shape of small orders or that they keep their sales unusually quiet. On October 1, according to the official data, the sales aggregated 976,536 tons of Rails of 50 lb and over, against 894,798 tons on September 1 and 860,755 on August 1. September, therefore, added 81,738 tons to the order books, which is more than the meager reports received during that month would have indicated. Deliveries, of course, are larger, being at a 100,000-ton rate monthly. The figures stand as follows: Up to July 1, 145,423; August 1, 584,938; September 1, 699,027 and October 1, 799,956 gross tons. This does not, of course, include light Rails, under 50 lb ℔ yard, which will considerably swell the total, but which are not subject to the arrangement entered into by the mills. The official reports do not give the sales for delivery in 1892, nor are these figures expected until late in this year. In many cases it remains optional with the mills when they roll the material contracted for, and it is possible that some of them will turn out some of the Rails contracted for delivery next year during the balance of this year. In spite of all rumors to the contrary, the price remains $30, at mill, nor is there any likelihood of concessions in standard sections. The mills never have had as strong an arrangement as they are now working under. It has stood the test of many weary months of depression, and can easily outlast any further period of dullness to which it may possibly be subjected. The Rail manufacturers are all convinced that 1892 will bring them a very active year. Any break in the price now would attract no business, and would seriously disturb the hopes of good profits in 1892. The price of Rails is reasonably low, considering how seriously the cost is affected by moderate employment. The only danger now is that Rail buyers will too long delay their orders for spring and summer requirements, and then late in the season come with a rush and demand immediate delivery. That would merely be a repetition of past experience, costly to the consumers and demoralizing to the producers. The fact that some of the leading lines are putting in their orders for next year's requirements proves that they expect no decline in prices and realize that long delay may lead to embarrassments. It is true that some of the roads who have placed orders

are large carriers of raw materials for the rail mills, who have, therefore, some interest in keeping them busy during the dullest season. But there are roads not actuated by such considerations who have contracted for at least a part of their requirements. So far as we can learn there is very little complaint among the railroads as to prices, which the majority consider reasonable. The principal obstacle to the placing of orders now is still the reluctance on the part of railroad managers to incur any obligations until their financial position has become better. It is growing clearer every day that the finances of many corporations were in a much worse condition than the business community generally had any idea of. A good many of them are now and will for some time to come be forced to apply increased earnings first to the repayment of loans. This is regarded by close observers as the principal reason why the Iron and Steel trades have failed to obtain the large orders for material which they know will ultimately be called for. How long this period of adjustment will last is largely a matter of conjecture. Some of those interested in the Rail trade still adhere to the belief that the demand so long withheld may come at any time. Others hold that it may be delayed until well into spring. One point upon which mill managers lay much stress, as bearing upon consumption, is the rapid increase in the weight of Rail sections, which greatly enhances the tonnage. As an indication in this respect, we may note that the Pennsylvania Railroad is asking for bids for a 100-lb Rail.

Financial.

The announcement that Italy has removed the embargo on American pork was received with gratification, and at Washington word is expected daily that American pork will no longer be excluded from France. An improvement in trade relations with both countries will naturally follow. Already a New York packing house has received a considerable order from Germany for meats, the first since the removal of the German prohibition of hog products. The reports from North Dakota with regard to the condition of the spring wheat crop show that practically no progress has been made with thrashing during the last fortnight, but as yet no abatement is made from the recent high estimates of the incoming crop, taking the country as a whole. The aggregate cereal production is assumed to exceed that of 1890 by at least 1,000,000,000 bushels, and after making all deductions for food and seed there seems to be a promise of 240,000,000 bushels for export of wheat alone. If Europe ten years ago purchased 186,000,000 bushels at an average price of $1.11 per bushel, will she not this year, when pressed by greater necessities, buy a much larger quantity at the lower prices now prevailing? It is noted, however, that despite the reported famine in Russia, she has thus far exported more wheat than a year ago. The shortage in France and Germany also proves to be less than was feared; in Germany wheat is 18% below the average and rye 20%. In the New York market trading during the week has been larger on export orders, without radical change in prices. The large forward movement of grain from the Northwest, after a temporary check, has been resumed. Western shipments of Anthracite Coal are also heavy. Railroad returns are satisfactory. A more cheerful tone results from receipts of gold from Europe, nearly $3,000,000 having arrived since Saturday, bringing the total homeward movement thus far up to about $19,000,000. Disagreement among the railroads in regard to transcontinental freights and the subsidy paid to the Pacific Mail Line was followed by a large meeting of California merchants in San Francisco, which resolved that a traffic association should be formed to encourage increase of competition in rail and ship transportation.

The Pacific Mail Company announce that they will issue $3,000,000 6 % bonds for new boats for their China service, provided that they get the contract from the Government to carry the mails under the new postal law. The bids will be opened October 26.

Stocks continued dull and irregular, influenced by unfavorable reports until Thursday, when the success of the Russian loan in Paris and the unchanged Bank of England rate stimulated rebuying for European account. On Friday the market opened at an advance for the Gould stocks on the publication of returns of earnings by the Missouri Pacific for the first time in eight years. The Northern Pacifics were favorably influenced by the decision of the United States Circuit Court sitting at Fargo, N. D., confirming the title of the company to valuable mineral lands. Saturday's favorable bank statement exerted but little influence, and on Monday there came rumors of a political crisis in Buenos Ayres, which was claimed, however, to have no significance. Odd lots of Adams Express Company sold as low as 134, as against 147 before the Hoey incident was made public.

On Monday the arrival of more gold and a report that leading bankers looked for moderately large shipments from Europe before the close of the week appeared to impart a better feeling to the market. Adams Express Company's shares advanced to 145, the figures at which the stock stood before the recent trouble, all the assets having been found intact.

The exports of merchandise from this port in the week were valued at $8,442,094, the largest amount in the same week for many years. The principal items are grain, cotton and petroleum.

United States bonds were steady, as follows:

U. S. 4½s, 1891, extended	100
U. S. 4s, 1907, registered	116¾
U. S. 4s, 1907, coupon	116¾
U. S. currency 6s	111

Money was easier. Time money was offered more freely and lenders were less exacting regarding the character of the collateral. Loans were made at 4 @ 4½ % for 30 to 60 days, and at 5 @ 5½ % for from three to six months on prime security. Commercial paper met with a good inquiry from out of town, and the indications point to a better demand from city banks. Quotations were 5¼ % for 60 to 90 day indorsed bills receivable and 5¼ @ 6½ % for longer dates. The bank statement showed a gain of $4,487,300 in cash and of $2,390,225 in surplus reserve, and this item now stands at $9,029,700. Loans expanded $2,500,000, indicating a more active mercantile demand. In Chicago money was easy to borrowers at about 6 %; business slow. New York banks notice increasing inquiry from the South. The efflux of currency to the interior is on a smaller scale than is usual at this period of the year. Bar silver closed in London at 44 9/16 d. ℔ ounce. The commercial price of bar silver in New York was 96⅛¢ ℔ ounce.

Under the pressure of commercial bills, foreign exchange weakened, and the rate for demand was lowered to $4.84. Larger supplies of cotton bills are in sight, as well as bills drawn against recent heavy purchases of grain, so that further shipments of gold would ordinarily result.

A free movement of groceries was noticed on country orders, and the dry goods trade was better, some western buyers being on hand before the close of navigation. A steady market is promised. Cotton is depressed by large receipts at the seaboard, amounting to 500,000 bales, during the week.

The Guarantee and Indemnity Company, a new trust company, will soon be ready for business. The offices of the company will be in the Mutual Life Insurance Company's building on Nassau street. The Board of Directors will include some of the best-known business men in New York.

Coal Market.

Beyond increased firmness the Anthracite Coal trade has not changed during the week. There is a good, fair trade in progress and prices are well maintained, but it would not be correct to say that much Coal has been sold at the last advance. Liberal shipments to Western points are stimulated by the approach of winter, but there is said to be less anxiety in regard to the supply of cars for transportation. Lehigh operators maintain their independent position, but prices nearly coincide with those of Free Burning, excepting Broken and Egg, which, as usual, are graded higher. All steam Coal, whether Anthracite small sizes or Bituminous, is in good demand. Quotations are about $2.25 @ $2.50 for Pea alongside. Buckwheat, $1.75 @ $2. Most of the fresh mined Coal is said to go directly to the consumer, so the stocks are slightly reduced. The production of Anthracite Coal during September was 3,333,404 tons, a decrease of 94,673 tons as compared with the same month last year. Production for the last week, 939,761 tons; total production for year, 29,628,554 tons. Pennsylvania coal tonnage for the week, 269,749 tons; coke, 106,449 tons. Reading tonnage for the week, 296,000 tons. Freights are down at Port Richmond to 60¢. The Clearfield output for the week was 65,134 tons; shipments by H. and B. T., 44,765 tons; N. and W., 50,670 tons; Beech Creek, 47,210 tons; Chesapeake and Ohio, 67,148 tons.

The Philadelphia *Ledger* says: "The better condition of the Anthracite Coal business was reported as enabling the Reading Company to work every one of their collieries on full time—ten hours daily—which is a more complete employment than has been known for years.

Metal Market.

Copper.—Prices have further depreciated and the market is weaker, if anything, than it was at the date of our last review. That it is as dull is testified to in all quarters. In short, the surface indications are that the trial of endurance has found consumers the strongest up to this time. Regarding the opening of the Anaconda mines no reliable information is volunteered here, but our special cable dispatch from London mentions contracts for Anaconda matte, for delivery up to April next, that are suggestive, if nothing more. For that matter, it is more than possible that those contracts are responsible in a good measure for the demoralization in the London market and for the feverish condition of the local market, clearing up, as they virtually do, uncertainties as to the future of the Anaconda. In this quarter there have been sales of Lake Superior Ingot to the extent of 250,000 lb or more at prices ranging from 12.15¢ down to 12¢, cash. The latter price doubtless reflects full local market value for round lots at the present time, since 100,000 lb went at that the past few days. Casting brands are selling in a small way at 11½¢, but for round lots 11½¢ is all that could be obtained and buyers at over 11¢ are few and far between. A special cable to the New York Metal Exchange stated that it was reported in London that the sale of the Société des Metaux Copper has been postponed until December 2.

Pig Tin.—London has furnished more or less variable reports from day to day, the net result of which would appear to be in buyers' favor, and the primary sources of supply have furnished a "bear" card in the shape of heavy shipments from the Straits, the latter amounting to no less than 1525 tons for the first half of the month. With these odds against them the chief local holders have, however, kept a firm grip upon the market, through dealing out spot parcels to the out of town trade at or near local net cash rates, and offering to take round lots on spot in exchange for November delivery at 5¢ to 10¢ ℔ 100 lb premium. The local situation is thus more cloudy, if anything, than it was a week ago, and what shape affairs will take upon the arrival of overdue shipments is problematical. Pending developments speculation is practically at a standstill, and large consumers, who evidently begin to gain some idea of the manipulation that is being indulged in, are buying with more than ordinary caution. On Wednesday prompt and current month deliveries were 20.10¢ bid, 20¼¢ asked, while later months were offered at 20.15¢, with only 20.05¢ bid.

Pig Lead.—Prices for this metal have dropped about 15¢ ℔ 100 lb without stimulating business to the slightest extent. Sales seem to be even more difficult to make at 4 30¢ at the present time than they were two weeks ago at ¼¢ over that rate. That there has been some miscalculation as to September and October consumption is plain, and it looks as though there was a mistake also in the estimates of the extent to which future wants would be anticipated. In any event, the anxiety just now is one-sided—that is, wholly on the side of smelters and the few outside holders who purchased last month. At the close, bids of 4¼¢ for round lots were solicited.

Spelter.—Prime Western has been sold in carload lots at 4.97½¢ for November, and at 5¢ for earlier delivery, but to a moderate extent only. Besides being thus weaker the market is positively dull, neither galvanizers or Brass manufacturers being inclined to buy in excess of imperative wants.

Antimony.—The market has been quiet, but prices are firmly held. Hallett's is quoted at 10¾¢, LX at 11¼¢ @ 11½¢, L. J. & C. at 11¢ @ 11¼¢ and Cookson's at 13¢ @ 13½¢, in wholesale quantities.

Tin Plate.—Prices have undergone very little change, and the market, as a whole, shows fairly steady tone. The home trade distribution is running very fair, and appears to be well up to the average for the season, but the movement in futures is confined chiefly to purchases by packers of export goods. We quote: Coke Tins—Penlan grade, IC, 14 x 20, $5.30; J. B. grade, do., $5.45; Bessemer do., $5.35; Siemens Steel, $5.50. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.75; Siemens Steel, IC basis, $5.85 @ $6; IX basis, $6.85 @ $7. IC Charcoals—Melyn grade, $6.50; for each additional X add $1.50; Allaway grade, $5.85; Grange grade, $5.90 @ $5.95; for each additional X add $1. Charcoal Ternes—Worcester, 14 x 20, $5.70; do., 20 x 28, scarce; M. F., 14 x 20, $7.50; do., 20 x 28, $15.25; Dean, 14 x 20, scarce; do., 20 x 28, $10.70; D. R. D. grade, 14 x 20, $5.25; do., 20 x 28, $10.12½; Mansel, 14 x 20, $5.50; do., 20 x 28, $10.45; Alyn, 14 x 20, $5.50; do., 20 x 28, $10.45; Dyffryn, 14 x 20, scarce; do., 20 x 28, $11.25. Wasters—S. T. P. grade, 14 x 20, $5; do., 20 x 28, $9.85; Abercarne grade, 14 x 20, $4.90; do., 20 x 28, $9.70.

New York Metal Exchange.

The following sales are reported:

THURSDAY, October 15.

32 tons Lead, December ..... 4.30¢
100 tons Tin, October. ..... 20.10¢
100 tons Tin, November... ..... 20.10¢

FRIDAY, October 16.

64 tons Lead, November ..... 4 30¢
15 tons Tin, spot.. ..... 20.12½¢
15 tons Tin, November..... 20.10¢

TUESDAY, October 20.

50,000 lb Lake Copper, October .... 12.00¢
25 tons Tin, October. ..... 20.10¢

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, October 21, 1891.

The market for Pig Iron warrants has been flat. Prices for Scotch have not varied much from 47/, but Cleveland weakened off to 39/11 and Hematites to 49/8. Stocks in Connal's stores remain almost stationary, the latest returns showing 498,000 tons Scotch and 150,000 tons Cleveland. Although warrants remain in neglect, makers report more business doing in Cleveland and there seems to be a better feeling also on Hematite Pigs for forward delivery. Latest sales of warrants were at 47/ for Scotch, 40/ for Cleveland and 49/3 for Hematite.

Old Material (Iron) is moving more freely and dealers report a scarcity of Rails for immediate shipment.

Pig Tin Prices dropped about 15/ under the effect of realizations caused by reported heavy Straits shipments during first half of the month, this liquidation having offset the effect of liberal buying early in the week. At present there is little outside speculation and consumers are buying carefully. Australian Tin, which is still scarce, commands 35/ premium over Straits.

In Copper prices there has been a decline of about £1. 10/ and the market is unsettled. Consumers are still holding off, being influenced by the fact that large quantities of three months' futures bought last July are being liquidated. More or less pressure has also been brought to bear upon the market by certain dealers who appear to be bent upon keeping prices down until the sale of the Société holdings, which is on the boards for this week. Transactions in furnace material have been on a large scale, including 2500 tons Anaconda Matte for delivery up to April, 1892, terms not made public. European spot stocks are reported to have increased 1283 tons last month and the visible supply 597 tons. Chili charters for the fortnight were about 1000 tons.

Large buyers for Tin Plate are still holding aloof and current business is chiefly in moderate parcels for home use, 'Frisco account and Russia. Russian buyers are paying 13/3 for choice brands of Cokes and makers are, therefore, firm in their views. Several American offers of 12/9 for ordinary Cokes have been refused.

Bessemer Pig.—Makers' prices about the same as last week and the market steady at 50/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Scotch Pig Iron.—Maker's brands move off rather slowly, and the leaning of prices is still in buyers' favor.

No. 1 Coltness,	f.o.b.	Glasgow	57/6
No. 1 Summerlee,	"	"	57/
No. 1 Gartsherrie,	"	"	57/
No. 1 Langloan,	"	"	57/6
No. 1 Carnbroe,	"	"	48/6
No. 1 Shotts	"	at Leith	58/6
No. 1 Glengarnock,	"	Ardrossan	58/
No. 1 Dalmellington,	"	"	51/
No. 1 Eglinton,	"	"	51/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—The volume of business is moderate and the market barely steady at 40/ for No. 3 Middlesborough, f.o.b

Spiegeleisen.—Demand is still running light and prices are without change. English 20 % quoted at 95/, f.o.b. shipping port.

Steel Rails.—Business without improvement and prices barely steady. Heavy sections quoted £4. 2/6 and light sections £5 @ £5. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—Dealings light and the demand no better. Makers quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Sales continue rather slow and at former prices. Bessemer, 2½ x 2½ inches, quoted at £4. 7/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—The market remains quiet and unchanged. Bessemer quoted at £4. 7/6, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Demand fairly active and the market firm. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 2/6 @ £3. 5/, f.o.b.

Scrap Iron.—There is a fair demand, and prices are steady. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—No change in prices. Demand fair. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Manufactured Iron.—A fairly active trade in most lines at former prices. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	.....			@	8	10	0
" Common "	6	15	0	@	6	17	6
Staff. Bl'k Sheet, singles...	7	10	0	@	7	12	6
Welsh Bars (f.o.b. Wales)...	5	10	0	@	5	12	6

Pig Tin.—Market closes quiet and barely steady. Straits quoted at £91. 5 @ £91. 7/6, spot, and £92 @ £92. 2/6 for three months' futures.

Copper.—Market still unsettled but somewhat firmer at the close. Merchant Bars quoted at £49. 12/6, spot, and £50. 5/, three months' futures. Best selected, £53. 10/.

Lead.—No change in prices. Demand moderate. We quote at £12 for Soft Spanish.

Spelter.—Demand slow and prices barely steady at £23. 10/ for ordinary Silesian.

Tin Plate.—The market barely steady at the close and quiet. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade..	.....	15/ @	15/6
IC Bessemer Steel, Coke finish....	.	13/3 @	13/6
IC Siemens " " "	... .	13/6 @	13/9
IC Coke, B. V. grade.....		13/3 @	....
Charcoal Terne, Dean grade....	.....	13/ @	....

HARDWARE.

Condition of Trade.

IF IT WERE NOT that expectations had been formed of an exceptionally heavy business, the trade now doing would probably be regarded as satisfactory. The volume of business is unquestionably large, but it is not as yet up to the expectations which had been formed in view of the splendid crops. Few of the large buyers are placing orders in advance of their ordinary requirements, having apparently little confidence that there will be an early recovery in prices. In certain lines of goods, however, which are very low, some of them have covered their needs for some time to come. There are indications that the retail trade are placing their orders somewhat more freely and business is beginning to feel the effect of this in an increased activity and a slightly better tone. Prices, however, remain without improvement, and the market, as a whole, may be characterized as lacking in strength. This manifests itself in the condition of some of the leading staples, and in the desire on the part of not a few manufacturers to secure orders in some instances by offering slight concessions. The financial conditions are, however, regarded as improving, and there is less complaint of difficulty in collections.

The following advices from Farwell, Ozmun, Kirk & Co., St. Paul, Minn., refer to the condition of things in that market:

There is but little of special importance just now to be said of the trade. Business in all jobbers' lines is good, but in Hardware there is but little gain in the rate of increase over the corresponding season last year, beyond the rate that has been maintained during the entire year. The probability is that the Hardware trade will experience more benefit from the large crops in the way of increased trade next season than this fall, as farmers are too busy to use their time in improvements, further than is absolutely necessary. Prices are fairly well maintained in most lines, and we hear less complaints among jobbers of cutting prices than usual. The cut in the price of Wire has not affected the trade materially. It is too late in the season to increase orders in it to much extent. The great source of anxiety to the Northwest this fall has been and still is as to the ability of farmers to save their heavy crops. The weather has been quite unfavorable, especially in Northern Minnesota and North Dakota, and the crops have been injured to some extent, but with favorable weather from now on, the damage will probably not be very large.

Chicago.

(*By Telegraph.*)

The demand for Shelf Hardware is steadily improving, every week showing about the same increase in volume of business. The character of the trade is now more nearly realizing the expectations of the large merchants here, but it still falls short of the proportions of the genuine fall trade. Staple goods are not moving as they should. Nails, Barb Wire and Sheet Iron are dragging. Seasonable goods are fairly active, but the great bulk of the trade continues to consist of straight Hardware.

St. Louis.

(*By Telegraph.*)

There are no special changes to note as having happened during the past week. Jobbers are kept very busy and have their full force employed filling orders. Shelf Hardware, Heavy Hardware and general assortments of fall and winter goods comprise the major part of the orders at present being received from out-of-town customers. Wire Nails are dull, notwithstanding prices are lower than for some time past. Barb Wire is unchanged, so far as prices are concerned, although complaints are heard regarding the recent action of the Columbia Patent Company in changing the price. Guns and Ammunition are in urgent demand, and inquiries are received for Skates, although as yet the trade in this specialty is not heavy. On the whole, the market is in fair condition with the exception of collections, which fail to improve to any extent.

Notes on Prices.

Cut Nails.—The Cut Nail market is in a decidedly unsatisfactory condition and no improvement has taken place since our last review. There is complaint of sluggishness in the demand, and while a good many Nails have been shipped, stocks are apparently inclined to accumulate. Some of the manufacturers are unwilling to accept orders for future delivery at ruling prices, but there are others who are willing to make contracts for a month or two ahead. During the past week or ten days one or two large lots of Iron Nails have been sold at about $1.45, but $1.50 is the general price for round lots at mill. This is also the quotation for Eastern Steel Nails in similar parcels. In the Wheeling district the quotation is about 5 cents per keg higher.

Chicago, by Telegraph.—Steel Cut Nails are fairly active and steady, the local makers finding their capacity well engaged for this month and inquiries coming forward for next month. Prices are unchanged, quotations running from $1.65 to $1.70 for 25 to 30 cent average. Jobbers quote $1.75 to $1.80 from stock.

Wire Nails.—The Wire Nail market remains in substantially the same condition as for the past few weeks, quotations for round lots, at mill, being $1.80 to $1.85, from which concessions are made in special cases on exceptionally desirable assortments. Small lots from store are held at from $2 to $2.15, according to circumstances. There have been no new developments in the negotiations between the manufacturers with reference to control of the market, and it is regarded as very questionable whether the effort in this direction can be successful.

Chicago, by Telegraph.—Inquiries are light, which is only to be expected in view of the peculiar way in which the heavy buyers are now receiving offers from the mills. Within the past week very large sales have been made here at low prices to run off stocks in factory warehouses. While the exact prices are not known, it is evident that $1.90, Chicago, has been shaded. Small lots from stock are now selling at $2.

Barb Wire.—The Barb Wire market has developed no new features. The volume of trade is moderate and the new prices are generally accepted and maintained.

Chicago, by Telegraph.—Manufacturers are booking a steady run of orders at schedule prices, which are unchanged. Jobbers report but a limited demand at present and do not anticipate a much larger trade until farmers can turn their attention from threshing to fixing up their farms. Quotations are $2.65 for Painted, in small lots, with 50¢ ₱ 100 added for Galvanized, 10¢ off for carloads.

Glass.—There is a stiffening tendency in the Glass market on American Glass, owing to the broken assortments in makers' and jobbers' hands. The lack of the demand usual at this season of the year is given as the only reason why prices should not be very much higher. It is understood that New Jersey factories who have no Glass to deliver are quoting in the neighborhood of 80 and 20 per cent. discount; but this is referred to as probably done to hold their trade in future, by appearing to be willing to sell at low prices. In view of the condition of the market, some jobbers are taking orders for American Glass at such prices that should the factories fail to have stock to fill them at the time of delivery the jobbers could substitute French Glass and yet make a profit on the orders. The price for French Window Glass for the month of November will depend largely upon the price made on American Glass at the Columbus meeting, which is to be held this week, and also upon the starting of American Glass factories, and their ability to supply an assortment sufficient to fill orders. Quoted prices remain unchanged upon the following basis: American Window Glass, in carloads, 80 and 10 and 5 per cent. discount; less than car lots, 80 and 5 per cent. discount; French Window Glass, 75 and

10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and Imported Plate at a discount of 60 per cent.

Cordage. — The Cordage market is characterized by a decidedly firm tone, and an advance of ¼ cent per pound has been made by the associated manufacturers. As the trade is aware, prices in this line have for some time been exceedingly low and irregular, owing to the efforts made by the National Cordage Company to induce outside manufacturers to enter the combination. Their effort in this direction is now regarded as having been entirely successful, and there are at present no concerns of importance outside of the National Cordage Company. The way is thus made clear for an advance of prices, as noted above. Manufacturers are also refusing to accept orders for future delivery except at prices ruling at the time of shipment. The market is thus, it will be observed, characterized by firmness, and it is not unlikely that another advance will follow before long. We give below, in tabulated form, manufacturers' prices for large lots, f.o.b. factory. An advance of about ¼ cent per pound is usually made by jobbers in small lots:

Description.	Manila.	Sisal.	New Zealand.
7-16 inch diameter (1¼ inches circumference) and above	$0.09½	$0 06	$0.05½
5-16 " " (12 thread)	.10	.06½	.06
5-16 " "	.10½	.06½	.06½
¼ " " (6 and 9 thread)	.10½	.07	.06½
3-16 " " (fine 6 thread)	.11	.07½	.07
3-16 " " (extra fine 6 thread)	.11½	.08	.07½
3-16 " " (3 thread laid)	.10	.07½	.06
Hay Rope, medium and coarse	.09½	.06	.05½
" " fine	.10	.06½	.06
" " extra fine	.10½	.07	.06½
" " if unoiled, extra	.00½	.00½	.00½
" " if laid, extra	.00½	.00½	.00½
Hide " medium and coarse	.09½	.06	.05½
" " fine	.10	.06½	.06
" " extra fine	.10½	.07	.06½
" " if unoiled, extra	.00½	.00½	.00½
" " if laid, extra	.00½	.00½	.00½
Bale " medium and coarse	.09½	.06	.05½
" " fine	.10	.06½	.06
" " extra fine	.10½	.07	.06½
" " if unoiled, extra	.00¼	.00½	.00½
" " if laid, extra	.00½	.00½	.00½
Spun Yarn, medium and coarse	.09½	.06	.05½
" " fine	.10	.06½	.06
" " extra fine	.10½	.07	.06½
" " if unoiled, extra	.00½	.00¼	.00½
" " if laid	.00½	.00¼	.00½
Tarred Lath Yarn, medium and coarse, single	.07½	.05¾	.05¼
" " " fine, single	.08	.06¼	.05¾
" " " extra fine, single	.08½	.06¾	.06¼
" " " laid, extra	.00½	.00½	.00½
" " " 2 or 3 ply, same as spun yarn	.....	.....	.....
Quarry Rope (selected stock), tallowed or untallowed	.10	.....	.....
Four Strand Rope (2 inches circumference and under), extra	.01	.....	.....
Tallowed, extra	.00½	.....	.....
Unoiled, "	.00½	.....	.....
Mixed Manila and Sisal Rope, basis	.07¾	.....	.....
" " " New Zealand Rope, basis	.07½	.....	.....

Coffee Mills.—The Association of Coffee Mill Manufacturers has terminated by limitation, and no effort has thus far been made to continue it, and the market is at present an open one. There has, however, thus far been no material change in prices; those which have been ruling being regarded as pretty low. It is, however, not unlikely that in special cases former quotations will be shaded.

Hand Screws.—The following is the price-list of the Grand Rapids Hand Screw Company, Grand Rapids, Mich., on their Hand Screws, a special feature of which is the saw-cut thread. The list is subject to a discount of 35 per cent.:

Number.	Diam. of screw. Inches.	Length of screw. Inches.	Length of jaw. Inches.	Size of jaw. Inches.	Opens. Inches.	Price per dozen.
1	½	9	7	1¼ x 1¼	4	$2.25
1½	⅝	11	8½	1⅝ x 1½	5	2.75
2	¾	13	10	1⅝ x 1⅝	6½	3.50
3	⅞	14	12	1⅞ x 1⅞	6½	4.00
4	⅞	16	12	1⅞ x 1⅞	8½	4 50
5	⅞	16	14	2 x 2	8	5.00
6	⅞	18	14	2 x 2	10	5.50
7	1⅛	18	16	2¼ x 2¼	9½	6 00
8	1⅛	20	16	2¼ x 2¼	10½	6.50
9	1⅛	20	18	2½ x 2½	10	7.00
10	1⅛	22	18	2½ x 2½	12½	7.50
11	1¼	22	20	2½ x 2¾	12	7.75
12	1¼	24	20	2½ x 2¾	14	8 00
13	1¼	24	24	2¾ x 3	13½	9.00
14	1¼	26	24	2¾ x 3	15½	10.50

Letter From South Africa.

THE FOLLOWING LETTER from Mr. Lvon, our special representative abroad, will be read with pleasure, indicating as it does the interest taken in the country from which he writes in American Hardware, and particularly in specialties, for which he reports a considerable demand. The indications of an increasing market for many kinds of Hardware will be observed with satisfaction, and manufacturers will find it to their interest to take prompt and energetic measures to secure a place for their goods in foreign lands.

CAPE TOWN, South Africa,
September 16, 1891.

During the two years that I have spent traveling abroad I have been very much interested in the remark, made very often by buyers as they showed me through their several establishments, that this thing or that they had picked up at our Centennial Exhibition, at Philadelphia, always adding to the effect that that was a grand place to post up on American products. Everywhere I have found a great interest taken in the Columbian Exposition, and a very large number of merchants here and at other points that I have touched at are planning to visit the great World's Fair. In fact, it is proposed to run one and perhaps two steamers direct from South Africa to New York for the exposition. I do not suppose that our Hardware manufacturers need any stimulus in regard to their exhibits, but if they did, such contact as I have with buyers abroad would be all the incentive that were necessary to provide not only a good exhibit, but to have as well some capable man in charge of it.

The interest abroad in American products has increased very much in the past 15 years, and the lines of American Hardware which can be exported have also grown into a much greater assortment. Merchants from these colonies are planning for the trip as a business venture, since the greed for American novelties is very great and buyers have found more profit in our products than in the European staples.

Since reaching this city Mason A. Schufeldt, special commissioner for Africa from the World's Columbian Exposition, has reached Cape Town, coming down the East Coast, and is exciting a great deal of interest in sending an exhibit from this country. The Government has appointed a Cape Commissioner to the exposition and has obtained 4000 square feet in the main exhibition building in which to display their four principal export articles—viz., diamonds, ostrich feathers, merino wool and mohair—in their several processes, together with a general Cape exhibit of sundries peculiar to the country. An exhibit of diamond mining and cutting, from the bowels of the earth to the finished gem, will prove very interesting to our great lovers of the white stone.

Speaking of the demand for American novelties, our Hardware manufacturers furnish more of these than they imagine, for many articles which we deem staples the colonial buyer jumps at as a novelty. I profited lately in exhibiting a ratchet Screw Driver; the buyer took hold with considerable interest, proved its efficacy for himself and ordered a liberal quantity, first possessing himself of the sample until after the mail should have gone.

The assortment of American Hardware exported to the English colonies can be very materially increased; of this I get continual proof. Too little interest is taken in it, or rather has been, let us say. A great advantage accrues where cargo comes out in American ships with American captains. The captain has two or three weeks in port, and going about with the help of our consul, proves a much better advertising medium for our products than one would think—a decided contrast to the indifferent captain sailing under a foreign flag. Our consuls are really very valuable commercial representatives. Captain Hollis here, late of our navy, is an old journalist and uses the press here very freely in the *sub rosa* interest of his flag.

POLHEMUS LYON.

Price-Lists, Circulars, &c.

BARROWS MFG. COMPANY, Lockport, Ill.: Locks, Bronze Hardware and Specialties, also Brass and Bronze Castings, Patterns, Models, &c. Their July edition, 1891, catalogue gives illustrations and price-lists of these goods, containing many unique and handsome designs. The goods are made in 16 different finishes, such as original color of bronze metal; finished work, colored rich chocolate brown; black background, bright surface; variegated mahogany color on plain surface; nickel, silver and copper plated; plated and oxidized, &c. The book contains nearly 150 pages, is well printed on good quality paper, with alphabetic index at the back. The matter is arranged by first classifying the Keys, then commencing at the front of a building and running through all the Hardware for the same. For instance, a store front is taken, then the front door Locks; first a description of the Lock is given, then its combinations, and so on through the vestibule, mortise goods, &c. This appears to be a most convenient arrangement, and one that will doubtless be appreciated by the trade. The catalogue is printed on paper of exceptionally good quality and in many ways illustrates the care with which it has been compiled and the enterprise of the company issuing it.

THE ELECTRIC CUTLERY COMPANY, 91 Chambers and 73 Reade streets, New York, fine Cutlery manufacturers: Supplement A, with illustrations of Electric brand Razors. The designs upon the handles of four of these Razors are patented, embodying unique and attractive features. The blades are finely finished, of the best material, with hand milling on the shanks, in the different widths, with round and square points, while the handles are finished in a variety of colors and designs.

Arrangement of Stores.

Bindley Hardware Company.

PART I.

The custom of expending upon the interior arrangements of business houses only a sufficient amount to make them suitable for money getting, without regard to convenience and comfort, is giving place to liberal outlay, resulting in modern and convenient arrangements and securing comfort and adequate facilities for doing business. This fact is forcibly brought out in Bindley Hardware Company's wholesale establishment, Pittsburgh, Pa., of which we herewith give illustrations and description. The business was founded by John England in 1856. It was changed to the firm name of England & Bindley by the accession of John Bindley in 1878. The same year Mr. Bindley purchased the interest of Mr. England, the latter retiring, at which time the firm name was made Bindley Hardware Company, and on February 5, 1890, it was incorporated with John Bindley, president; W. C. Reitz, secretary, and W. H. Cochrane, treasurer. The building which the company have recently erected is six stories and basement, with a frontage on Seventh avenue of 100 feet, extending back on New Grant street and Cherry alley about the same distance.

The walls, of a superior grade of well-burned brick, each weighing on an average 5½ pounds, are for the entire hight, 3 feet thick, with front and rear pilasters of 5 feet, running the entire hight of the building. The floors are of oak 3 inches thick. First a 2-inch plank running at an acute angle, the lower face being dressed and chamfered, forms the ceiling, on which is placed a 1-inch board running at right angles with the first. This forms a very stiff floor, as well as imparting additional strength to the general construction. The floor rests on oak joists 8 x 14, 30 inches apart from center to center, and they in turn rest on oak girders of from 18 x 18 to 14 x 14 inches. These girders on the first, second and third floors are supported by cast-iron columns, while the remaining floors have built oak columns. There are no ceilings, the girders, joists and flooring all being exposed, thus reducing th

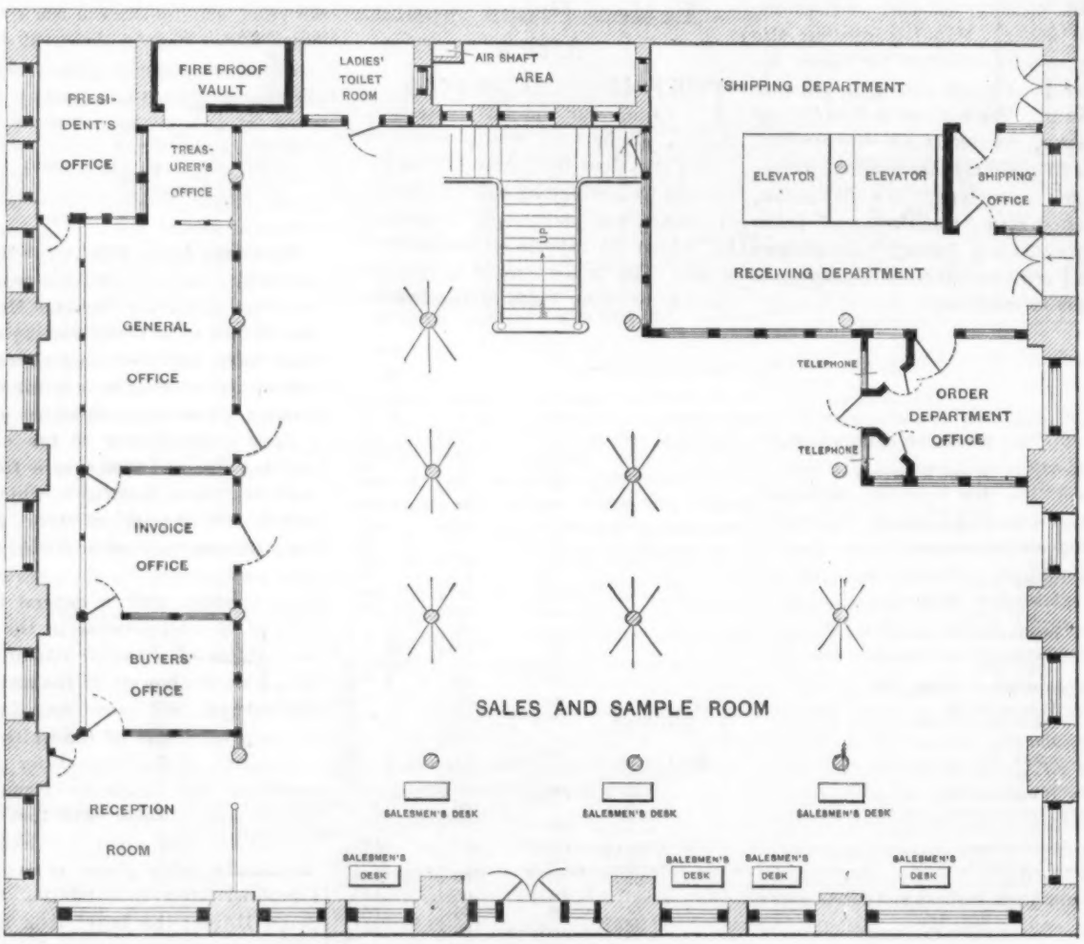


Fig. 687.—Offices, Sample Room, &c., of Bindley Hardware Co.

possibility of fire, and giving a corresponding reduction on rate of insurance. Fig. 687 shows the plan of the first floor, with the arrangement of offices, sample rooms, &c. The main entrance is on Seventh avenue, through which all patrons and employees have entrance and exit. All goods are received and shipped from the New Grant street entrance. In this room are twin elevators, from opposite sides of which the goods are received and shipped, thus avoiding conflict and annoyance incident to receiving and shipping through the same door. When goods are received they are sent to the department on the second floor, where they are opened, examined and inventoried. When the inventory is complete it is then sent to the buyer's office to be compared with the bill,

thus avoiding the possibility of any assumption on the part of the receiving clerk, as he has no guide to go by, either on quantity, class or description, except the actual goods which he is obliged to minutely describe. The reception room

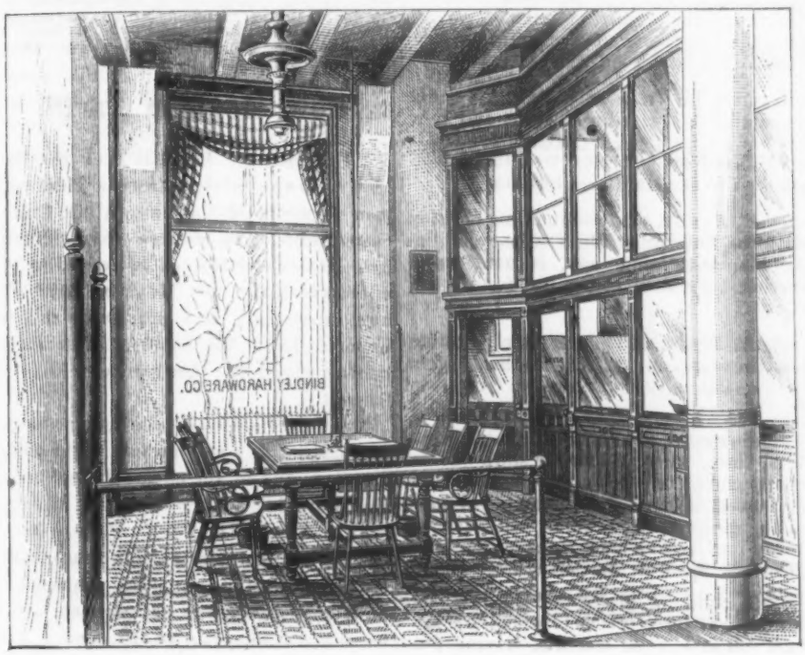


Fig. 688.—General Reception Room.

is the first of the series of offices located at the left of the building, and is shown in Fig. 688. In this room is a directors' table, with chairs, stationery and daily papers. Their customers, when in the city, are invited to make themselves at home in this room. Here they may attend to any correspondence, or pleasantly pass the time in waiting for a train. The buyers' office, shown in Fig. 689, is next in order. In this room is an electric bell and speaking-tube connection with each floor and department, as well as all the literature, paraphernalia and facilities for the prompt dispatch of business in his line. Next in order come the billing department, and then the general offices, while further to the rear are the offices of the treasurer and president. The general office and also the office of the treasurer have communication with the sales and sample room by means of wickets through which the outside business of the respective offices is transacted, thus making the interior arrangement of the two offices strictly private.

(To be continued.)

Trade Topics.

Manufacturers and Retailers.—With reference to sales by manufacturers direct to retailers we have the following communication from a Western house:

A subject of much importance to the Hardware jobbers of the country is the growing practice of many manufacturers of selling direct to the retailer and even to the consumer in competition with the jobber.

Many of the manufacturers seem to forget or ignore the fact that much of their success is due to the efforts of the jobbers in introducing their lines and keeping them before the trade. By the system of allowing the jobber to look after the trade of the retailer and him in turn that of the consumer, better prices are maintained, just as good satisfaction secured and a feeling of confidence established between all concerned. Instances are not uncommon where manufacturers having been asked for quotations on special orders, have quoted a price to the jobber, and by the same mail named to the jobber's customer as low or lower price, which effectually prevents his securing the order. Such quotations are usually referred to the jobber by his customer either to show him that he is not "in it" or to be used as a leverage to secure a lower price from him. This usually results in the jobber exerting special efforts to obtain a lower price from a competing manufacturer; securing same, he sacrifices his profits in order "to knock out" the first manufacturer. Thus it will be seen that the meddlesome manufacturer has lost a sale and in all probability a good customer, while the jobber has lost his profit, and his customer is no better satisfied than if he had bought the goods of the jobber and paid him a reasonable margin. It is a most despicable custom, and one can scarcely see why it is done. Another fault some manufacturers have is that of selling small jobbers on the same terms as the large houses, who buy from two to six times the quantity. Those manufacturers who are in the habit of conducting business on these principles might do well to remember that the jobbers are a power in the commercial world most difficult to overthrow; that there is a "limit at which forbearance ceases to be a virtue," and from present indications that limit is within hailing distance. Something "may drop" on them so hard that they will have to wriggle and squirm very actively to get from beneath it. At any rate, they can secure a greater amount of trade through the medium of the jobbers, and at the end of the year their profits will be far more satisfactory. The evil is an everlasting one, and undoubtedly some measures will have to be taken to abate it entirely or correct it.

Hardware Burglaries.—From a Hardwareman in Ohio, whose store has recently been burglarized for the fourth time, the stock of Revolvers and Cutlery in each instance being taken, we have an inquiry as to what is the best plan to pursue in order to secure the safety of this line of goods, which are referred to as too bulky to put into his safe. If, in addition to any police measures which might be adopted, our readers can suggest anything that the Hardwareman might do to insure the safety of such comparatively small and valuable goods, we shall be glad to hear from them. The matter is one of some importance, as there seems to have been of late many minor burglaries in which Hardwaremen have suffered the loss of such goods.

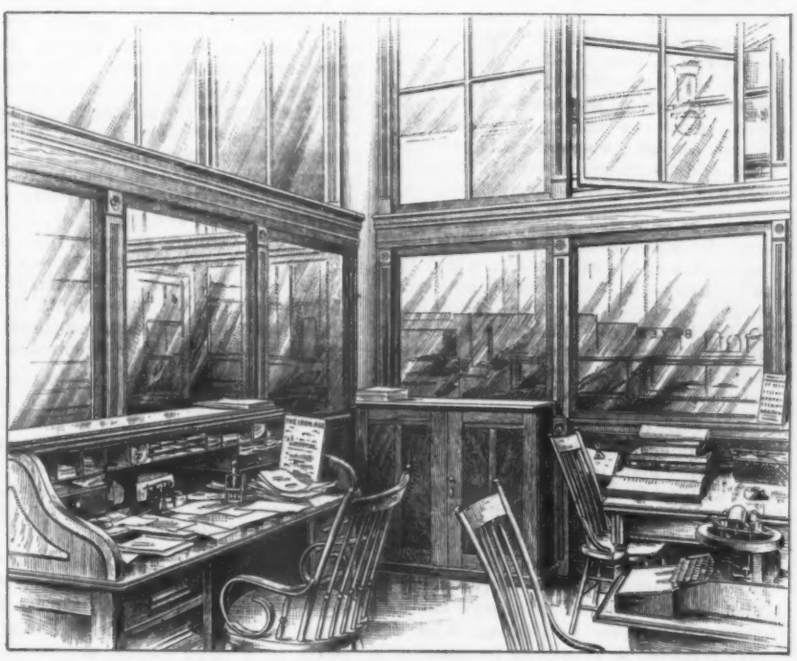


Fig. 689.—The Buyers' Office.

Trade Items.

THE WITTE HARDWARE COMPANY, St. Louis, Mo., are placing on the market an entire new line of Hammers of all the various kinds and sizes, which include Adze Eye Nail, Adze Eye Bell Face Nail, Engineers', Blacksmiths', Machinists', Riveting and Farriers'. These goods are described as made of the highest grade tool steel, nickel-plated and handled with extra hickory handles. They are packed in dovetailed wooden boxes containing half or one-third dozen, according to size and style. These goods are fully warranted in every sense of the word. The Witte Hardware Company advise us that they are building up a large trade for these goods and are receiving complimentary letters from all points of the country referring to them.

OUR READERS will observe on another page the advertisement of the American Needle and Fish Hook Company, New Haven, Conn., for which the Alford & Berkele Company, 77 Chambers street, New York, are agents. Attention is called to the quality of these goods and the prices at which they are offered.

IN THE REFERENCE in our last issue to the purchase of the plant, &c., of the Rhode Island Horse Shoe Company, Providence, R. I., it was inadvertently and inaccurately stated that their output was 1000 kegs a week. The correct statement is that their output is 1000 kegs a day.

CYRUS S. AVERY, for 15 years with the Enterprise Mfg. Company, Philadelphia, is now with the Cleveland Foundry Company, Cleveland, Ohio, and will represent them in their Hardware specialties to the jobbing Hardware trede.

NOBLE C. BUTLER, receiver of the American Wheel Company, issues a circular in which the trade are informed that after November 10 the receiver's office will be located at Indianapolis, Ind. Arrangements have been made by which customers adjacent to any particular factory can send their hurried and special orders directly to it, thus avoiding delays occuring in the transmission of orders to the general offices. Customers are reminded that orders are taken for delivery of Wheels during the season ending October, 1892, and assurance is given that such orders will be faithfully executed.

THE TRADE will observe on another page the advertisement of James H. Billington & Co., Philadelphia, in which they call attention to their Globe Packing, intended for Steam Engines, Piston Rods, Mining Pumps, &c. They also give a *facsimile* of their trade-mark, and call attention to the fact that none is genuine without this mark on the muslin cover.

THE CHICAGO TACK COMPANY, Chicago, Ill., announce that they are about to move their entire plant to Benton Harbor, Mich., and wishing to dispose of their manufactured stock they offer a variety of goods specified in their circular at special prices.

THE DEMING COMPANY, Salem, Ohio, announce that their New York office, 72 John street, will be in charge of their secretary, William L. Deming, who will take pleasure in answering by letter or in person inquiries relating to their goods. The company have recently enlarged their line of Pumps adapted to foreign markets.

THE GRAND CROSSING TACK COMPANY, Grand Crossing, Ill., are calling the attention of their customers to the fact that during the last few years many Hardware men had added to their line some of the goods formerly carried by houses handling Carriage and Saddlery Hardware, referring specially to Silver Lining Nails which they allude to as having become staple goods in the regular Hardware trade. Suggestions are given in regard to the most desirable sizes, prices at which the goods are offered, &c.

MR. AND MRS. A. R. TREADWAY, Cleveland, Ohio, recently celebrated the twenty-fifth anniversary of their marriage. Mr. Treadway is the Cleveland manager of the Peck & Wilcox Stove Company. They were the recipients of many sincere congratulations and good wishes.

GEORGE L. MILES of Tipton, Iowa, has remodeled his Hardware store, and now has one of the finest in Eastern Iowa. It is a handsome brick structure, well adapted to the Hardware business.

C. M. AVERY, who resigned his position with the Enterprise Mfg. Company, Philadelphia, some time ago, is now representing several lines in his former territory.

O. A. STEIN, 64 Federal street, Boston, has been appointed New England agent for the Union Lock Company, Lancaster, Pa.

THOMPSON & KELLEY of Columbus Junction, Iowa, whose Hardware store was recently completely destroyed by fire, which consumed a large part of the town, have taken measures to rebuild, and have already purchased a new stock of goods of Hibbard, Spencer, Bartlett & Co.

THE FIRM of Marckel & Co., Pelham, Minn., was dissolved October 15 by mutual consent. A. Marckel, having purchased the interest of his partners, will continue the business at the old stand.

THE TRADE WILL BE INTERESTED in the effective advertisement of the Glazier Strong Oil Stove Company, Chelsea, Mich., in which, in a facetious, forcible way, they call attention to their Perfect Oil Stove Heaters. The circular which they issue refers to the Perfect as a great ventilator, heating by circulation as well as by radiation. It is stated that the cold air is taken from the floor up through the cold-air jacket, passing entirely around the oil tank in such rapid current that it keeps the oil perfectly cool. This current of air then passes through the nickel air jacket, uniting in the combustion chamber with the burner current and moisture from the water reservoir, thus supplying oxygen in abundance to absolutely complete the combustion, entirely doing away with all smoke and odor. It is then passed out through the radiating drum into the room as completely purified as air can be. It is claimed that the cost of running the heater when the best oil is used is less than 1 cent an hour, and that it will heat a room in from 10 to 20 minutes.

MERSHON & RHODES of Mechanicsville, Iowa, have just put in a full line of Hardware from Hibbard, Spencer, Bartlett & Co., through Harry L. Davis, salesman. The firm have erected a handsome two-story brick for their Hardware store, and will carry a line of Stoves manufactured by the Detroit Stove Works.

THE NATIONAL KEG AND BOX COMPANY, Birmingham, Conn., and 97 and 99 Water street, refer to their Locked Corner Wood Boxes as taking the place of Pasteboard Boxes to a large extent, and as particularly desirable for use by Hardware manufacturers. They are made in three styles, with huge slide and nail covers. They state that their plant is situated so as to allow of shipments being made by the quickest possible routes, and that it is equipped with the most modern machinery. They claim that their improved machinery for printing on wood will do as fine work as can be done on paper.

CELLULOID ZAPON COMPANY, 31 Barclay street, New York, manufacturers of Lacquers and Varnishes, report the condition of trade in their lines as follows:

While the tone of trade at the present time is not as good as we hoped during the summer that it would be at this busy season, still our sales are heavy and the demand is fairly steady. We consider that our sales are a fair index of the general condition of the country, our products going as they do very largely to manufacturers of goods used in building and for domestic consumption. Judged from the standpoint of the amount of our material they use, the growth of the smaller manufacturers of metal wares is continuous and the output of the larger works steady.

New Mexican Tariff.

WE ARE IN RECEIPT of the following advices from a Hardware man formerly in business in the United States, who, now writing from Chihuahua, Mexico, advises us in regard to the effect which the new Mexican tariff will have upon Iron and Hardware articles imported from this country. The information given on this subject will be of interest:

Mention of a few of the changes in the Mexican tariff, which go into effect on the 1st prox., and of the effects thereof in the Hardware line, will no doubt be of interest to the readers of *The Iron Age*. One of the marked features is the increase on Bar Iron, which article has been subjected to an increase of duty of 100 per cent.—from 5 cents per kilogram to 10 cents. This change has caused the price of Bar Iron to advance 1 cent per pound in two weeks (from 8 to 9 cents), but this is only one-half of the necessary advance, since the difference in duty is quite 2¼ cents per pound. "Manufactures of Iron, not otherwise specified," are now subject to a duty of 20 cents per gross kilogram, while according to the new tariff they will pay 25 cents per kilogram, net weight. This change from gross to net weight causes some (light) articles to cost less duty under the new schedule than at present, notwithstanding the advance of 5 cents per kilogram. Especially noticeable is this in the case of such articles as Tin Coffee Boilers and like bulky goods, where the tare is generally in excess of the net weight. I am quite sure the packers in houses doing business in the cities on the Mexican border will be thankful for this change. One who has not "been there," can hardly form an idea of the amount of "shifting" which is done in houses exporting to Mexico, in order to make packages light to avoid excessive duty on tare weights, and to, at the same time, make them strong to withstand the rough handling they get here. But no relief has yet come for the poor soul who packs goods for shipment on mules to the mountains. The rule is: "Packages to be not over 5 feet long or 3 feet wide; to weigh not exceeding 150 pounds, and to be very strong." Of course we sometimes are unable to comply fully with these rules, and it then requires much persuasion to get a muleteer to take the package which does not fully meet his views.

It is reported that the Hardware store of Nice & Hinkey, Tonawanda, N. Y., was totally destroyed by fire on the morning of October 14. Loss on the building, $4500, insurance, $3000; loss on stock, $10.000, insurance, $5000.

Remittance Blanks.

FROM GEORGE I. HAGER, Burlington, Vt., we have received information in regard to some of the blanks which he is using in his business, which are referred to as convenient and the means of saving a good deal of labor. We reproduce below the substance of three of them. Fig. 1 is a blank for acknowledging remittances, being given in reduced size and the heading with date, address, &c., being omitted.

Your favor of ..... *enclosing* .....

..... *Dollars,*

is received and placed to your credit on account in settlement .....

With thanks for your remittance, and soliciting your future orders, I remain.

Fig. 1.

In making remittances Mr. Hager uses one or other of the forms, Figs. 2 and 3, according as payment is made by draft or check. These forms are also much reduced and the heading and signature omitted.

Enclosed please find draft No. ..... *on National Bank of* ..... *for $* ..... *in payment of Invoice of* .....

Please acknowledge receipt and oblige.

Fig. 2.

I enclose check No .....

on Howard National Bank of Burlington, for

$ ..... *in payment of Invoice of*

Please acknowledge receipt and oblige.

Fig. 3.

Modern Hardware Production.

BY W. W. B.

EVOLUTION, or rather revolution, is the most fitting term to apply to the changes that have taken place within the last few years in the line of Builders' Hardware. It was considered sufficient but a short time ago that the Hardware manufacturer should carry a few stock patterns and a limited number of Locks to enable him to fill all the demands for house trim. In the matter of Bronze Goods the design, if this application of the word may be used, was a conglomeration of stiff figures that had the appearance of being used simply to fill up blank space, and not as an attempt at decoration; nor with any effort to beautify the Escutcheon, Knob, or other piece of trimming. It is gratifying to know that the manufacturers have consigned these patterns to the scrap heap, and have replaced them with a line of Hardware that, generally speaking, is artistic and elegant. The old-style Lock has gone on the same errand—that of swelling the scrap heap—and is replaced by the more modern styles that have combined in them strength, durability and security.

This line of business has shown a marked growth and improvement, and has entirely changed in a short time. The reason is this: People have advanced in education, the appreciation of art has grown, and the Hardware manufacturer, to be in touch with the times, found it necessary to quicken his gait. Only a short time since there were a limited number of small concerns who made all the Hardware used by the builder, and made it in such a style as was required, with the seemingly fixed idea that a Lock that would keep a door shut under ordinary circumstances would fill the bill; that trimmings that trimmed were all that was necessary, and that the effect of the metal did not cut a figure; but now what have we in this line? Such firms as the Yale & Towne Mfg. Company; the P. & F. Corbin Company; A. G. Newman and numerous other firms, each one striving to outdo the other in the class of goods produced; and in this production employing thousands of skilled workmen as expert locksmiths, artists who are that in every sense of the word; designers who are capable, and who with their capabilities have produced some designs in Builders' Hardware and House Trimming that it is safe to say have never been surpassed, even by the ancients, whose proficiency in art metal work is proven by the relics of the past ages.

Art in the highest sense of the word is now employed in the manufacture of Hardware, and though it may be a surprise to the layman, it is nevertheless a fact, that on the pay rolls of some of the largest manufacturers may be found the names of men who stand at the head of their profession in their several lines, which include designers, sculptors or plaster workers, chasers and wood carvers. This may be readily appreciated by a visit paid to the warerooms of any of the leading manufacturers, where examples may be seen of metal transformed into decorative trimmings, and in this transformation having taken to themselves artistic form that is only possible under the hands of skilled artisans. All the different schools of architecture are employed in this line. The French and Italian Renaissance—names which are synonymous with grace and beauty—are much used, and generally with gold or silver plated surfaces; the Byzantine and Romanesque both play prominent parts in the present line of ornamentation, as does also the Gothic. The Moresque and the Elizabethan schools, while not so much favored, on account of a certain rigid stiffness, are still employed to a certain extent. The German Renaissance is growing to be more popular, and while graceful, has not the pleasing effect of the Italian or French. Hardware is a subject that is justly receiving more attention from the architect and the builder, and the Hardware clause is daily becoming more important. Most of the finer lines of Trimming are designed by the architect at the same time that the plans for the building are made. But at this point it may be stated that one is indeed hard to suit who cannot select trimmings from the stock patterns carried by the leading manufacturers.

There is one fault that might be remedied when the matter of Hardware comes before the builder—it is this: Delay in ordering the required trimming, and leaving the matter until the building is completed, and then finding fault with the manufacturer at the delay. There is probably not one man in one hundred who realizes what causes the delay or why it is that so much time is necessary in turning out the trimmings for a building. The reasons are these: The owner ex-

plains to his architect that he wishes the Hardware to be artistic and in keeping with the general architectural features of the building, and with this in mind the designs are made, more or less elaborate; the doors are to be made to a particular bevel or rabbet; the window stiles are all different in dimensions, no two on any floor being the same; the door stiles are made so narrow that they will not accommodate the ordinary lock, or may be are covered with molding. What is the result? The house is nearing completion, and the fact seems to have just been discovered that the Hardware has not been ordered. Then a hurry, a rush and a general worry, and the Hardware is wanted at once, and now come the practical points. The Hardware to trim the building will all of it have to be specially made. Each lock, escutcheon, sash fast and hinge strap will have to be made from a special pattern. What does this entail? Just this: Taking it for granted that the general design of the Hardware is in the Renaissance school, the plans are sent to the manufacturer and the special patterns are started. To make the patterns and complete the Hardware the following details come in·

The designs first go to the modelers in plaster. In this room the architect's ideas are transferred from the paper to plaster paris. The plaster is mixed and poured into molds, which have greater cubical contents than the piece of trim to be made. The plaster hardens quickly, and is soon in form for the expert modeler; and at this point the actual work commence. A tracing is made of the design, and it is then transferred to plaster in outline, and the modeler starts his work. Each leaf, each stem, each little line of shading is reproduced, and it is hardly necessary to say that in the intricate designs this work occupies days and sometimes weeks to complete.

The plaster pattern done, it is taken to the foundry, and here again care and nicety of workmanship is necessary. The plaster pattern is not like the regular metal pattern, ready to be put in the sand in an ordinary two-part flask. It has only one surface from which the casting can be made, and the molder must take two impressions from the pattern. One he uses to make the casting from, the other to get a sand impression from, to be used in connection with the first or face half. One-half the flask contains the face of the piece to be molded; the other half contains the back of it. The space left between the two flasks will receive the molten metal and form the casting, which is generally about $\frac{3}{32}$ inch thick. This casting makes the original or master pattern, but as it is in the casting it is as yet unfit for use. This casting goes now to the metal pattern maker, who finishes it roughly, puts in the spot marks where the screw holes are to be, cuts in the holes, if it is an escutcheon plate, for key and knob; puts in the company trade-mark, and now the pattern is ready, not for the molder; oh, no. The pattern is now ready for the chaser, and his work on it brings into relief all the little details. Each leaf has to be cut and shaded, and each little pearl has to be rounded and made perfect. The draft is put on here; by this is meant that the necessary cutting is done on the design to allow of its leaving the sand without holding any; or, in other words, to leave in the sand a perfect impression.

When the required number of castings are made from this pattern they go to the cleaning room, and here the gates or spurs are cut off and they are treated to a form of Turkish bath. The castings are first dipped in acid, then into a tub of boiling water, and finally they are dipped into a cold bath, at which point they are ready for the finishing room; but the acid has brought out a defect in some of the castings. This defect occasions one of those delays that are not understood by the waiting customer. The whole job is delayed another day, until another set of castings are made. When the whole number of perfect pieces are found they are sent to fitting departments and the necessary machine work is then done on them and they are then ready to go to the chasing room; and here the finished product go through the same treatment as the original pattern, and each piece is turned out as perfect in its detail as a fine piece of silverware. The Hardware is now ready for the finishing touches. It is taken to the polishing room, where it is prepared to receive either a coat of lacquer or to go through the plating process—as a rule the latter. It may not be known generally, but it is nevertheless a fact, that most of the Hardware in the finest design is either finished in gold or silver plate.

At this stage the Hardware trimming is ready for the packing room and shipping room. The process we have described is that of bronze trimming. When the trim is to be of iron then the process is somewhat different; after leaving the foundry the iron castings go to the Bower-Barff department instead of the chaser and polisher—this after they are fitted. The Bower-Barff is a secret, patented process that gives the metal a dead black appearance and renders it, to a more or less degree, rust proof.

Now follow the Locks, and even though it is a fact that a Lock is seldom made entirely new, for a special door, still changes have to be made in the front to suit special bevels or rabbets; the bolts have to be lengthened or shortened, as the case may be, or an entirely new front or bolt may be necessary to suit some unusually outrageous form of door stile. It may be said here that the architect seems to have an aversion to using the standard in matter of door stile, bevel, rabbet, &c., although there is for each a certain acknowledged though not fixed standard. It might be well for the architects to have this in mind, especially where hasty construction is necessary. All this tends to show that the production of special Hardware takes time, is expensive, and also that unavoidable delays occur; that each and every one adds its share to the worry of the owner, the contractor and the unfortunate salesman who has taken the order on a promise of delivery on a certain date. The object in view in stating the facts of production is: That nothing in the line of art will bear hurrying without marring the effect of the work. High-class Hardware of to-day is artistic in every sense of the word, and the rule applies most forcibly. To get good results in this line a full two weeks should be allowed for the most ordinary house trim, when the house is small and the trim plain; when the Hardware is all special, for a large building, a month should be allowed, and as much more as is possible. The results will be readily appreciated by all concerned and the effect of the trim will be manifestly more pleasing. Hardware production is a matter of care, of detail, an uncontrollable delay that should be taken into consideration.

It is Reported—

That William Messenger is about to open a Hardware store at Georgetown, Mass., in the Phenix block.

That Hanson, Webber & Dunham, Waterville, Maine, large dealers in Hardware, Stoves and Agricultural Implements, have started a branch store, in which they propose to handle Stoves exclusively.

That L. Warren intends going into the Hardware business at Wyoming, N. Y.

That Shaft & Moody have purchased the Hardware, Stove and Implement business of Louis Duehn, Clements, Kan.

That the Hardware store of C. R. Fulbright, Sparta, Ohio, was entered by burglars on the night of October 1, who secured about $75 worth of Revolvers and Knives.

That J. J. Kelley, formerly of Harmony, Minn., has embarked in the Hardware business at Simpson, in that State.

That William S. Rapp, Reading, Pa., has disposed of his stock of Tinware, Stoves, &c., to Louis Reeser.

That Cole & Cole's Hardware store at Council Bluffs, Iowa, was damaged by fire on October 8 to the extent of about $400 or $500. The loss was fully covered by insurance.

That Wright & Gardner have purchased the Hardware business of Z. F. Keyes, Hammond, Wis.

That W. K. Stafford, for many years manager of the Hardware department of Walton Bros., Fairbury, Ill., has purchased a stock of Hardware and embarked in the business at Forest, Ill.

That the Hardware store of Sumner & Morris, Madison, Wis., was burglarized recently and about a dozen revolvers taken. The cash drawer was not touched, though it was unlocked and contained some money

That Quick & Orum have succeeded B. H. Quick, Ottawa, Ill., in the Hardware and Stove business.

That burglars entered the Hardware store of John Anderson, Missouri Valley, Iowa, on October 5, and took $500 worth of goods.

That A. Allen has succeeded N. C. Kaufman in the Hardware business at Cologne, Minn.

That A. G. Alston has opened a Hardware store in the Odd Fellows Block, East Hardwick, Vt.

That the business of the late John S. Patee & Co., St. Joseph, Mo., has been bought by Dersch & Green, who will carry it on. Mr. Dersch is well known as a North St. Joseph business man; Mr.

Green has for the past five years had charge of the furnace department of Mr. Patee.

That Jack & Rogers' Hardware store, Tekamah, Neb., was entered by burglars recently. The night prowlers were detected before completing their work and the loss was insignificant.

That C. M. Loomis has embarked in the Hardware business at Lincoln, Neb.

That the Hardware store of Gross, Fritzeringer & Co., Slatington, Pa., was destroyed by fire last week, entailing a loss of $15,000. There was some insurance on the stock.

That E. B. Cook and George Uniacke have sold their interest in the Fort Payne Hardware Company, Fort Payne, Ala., to William T. Folsom of New Market.

That T. J. Adams will put in a $30,000 stock of Hardware in his new store building, recently purchased at Jacksonville, Fla.

That Burget & Lewis, Great Barrington, Mass., had their Hardware store robbed on the night of October 9. The goods stolen were valued at $250.

That Bodyfield Brothers have engaged in the Hardware business at Hartwick, Iowa.

That the Hardware firm of Loomis & Gates, Elmira, N. Y., has been dissolved by mutual consent. Mr. Gates retires and Mr. Loomis will continue the business.

That Zabel & Bretze have succeeded C. A. Zabel, Hardware dealer, Paynesville, Minn., Mr. Zabel having admitted Mr. Bretze to partnership.

That S. A. Coldwell has sold his Hardware store at Matteawan, N. Y., to John C. Berney.

That the Hardware store of Hanlon Bros., Oelwein, Iowa, was burglarized to the amount of $100. Revolvers, Razors and Knives were taken.

That Graham Brothers have succeeded the Hardware firm of Graham & Newton, Dayton, Wash., and will enlarge the business.

That H. S Holland, Northampton, Mass., intends locating at Belding, Mich., where he will engage in the Hardware business.

That Creed & Stillwell, Webster City, Iowa, have purchased the Hardware stock of Frank Bailey, Duncombe, Iowa, and will remove the same to Webster City.

That Sedberry Bros., Marshall, Texas, will remove their Hardware business to the Mulcahey Building of that city.

That Alexander & Robbins is the title of a new Hardware firm at Marshall, Ind.

That S. L. Smith has purchased the stock and leased the store of P. E. Brown, Pownal, Mass., and will open a Hardware store.

That W. V. Elliott has engaged in the Hardware business at Nogales, Ariz.

That Gutwald & Flynt, East St. Louis, Ill., have removed their Hardware store to the new brick building, No. 435 Collinsville avenue, where more room is had to accommodate their increasing business. They have fitted it up with electric lights and other improvements.

That articles of incorporation of the Banks Hardware Company, Henderson, Ky., have been filed. The amount of capital is $15,000, which may be increased to any sum not exceeding $50,000 by a majority vote of the stock. The incorporators are S. J. Banks, S. W. Norris and Jas. N. Banks.

That a five years' lease has been obtained of a building on Lower Pearl street, Sioux City, Iowa, by Chas. E. Faeth of St. Joe, Mo. The building is to be used for a wholesale heavy Hardware business, the stock to consist of wagon stock of all kinds—wood, iron, &c.

That a destructive fire occurred at Lima, Ohio, resulting in a loss of $92,000. Among other buildings destroyed was that of the Hardware firm of Ewing & Emerick, whose loss was $27,000; insured for $24,000.

That M. Frankoviz's Hardware store, at Fergus Falls, Minn., was recently entered by burglars, who stole $125 worth of Revolvers and Cutlery.

That the Johnson Hardware Company will open a Hardware store about October 20 in the Jones Block on East Second street, Johnstown, N. Y. This is a new concern, composed of Henry and J. L. Johnson.

That Barker, Belden & Co., Pittsfield, Mass., are about opening a new Hardware store, and expect to be ready to begin business the latter part of October.

That the store of J. N. High, Seaville and Creston, Ohio, was recently burglarized for the fourth time, Revolvers and Cutlery being taken.

That McDermott & Co., Clyde, Ohio, have sold their Hardware store to A. H. Funk, formerly of Kipton, Ohio.

That K. L. Whitaker has sold out his Hardware store at Mason City, Neb., to Deardorf & Elliott, who will stock up with a large and well assorted stock.

That Thomas B. Wren has embarked in the Hardware business at San Antonio, Texas.

That Peter Merstad has closed out his Hardware business at West Superior, Wis.

That McBride & Palmer, Nehawka, N. Y., have built an addition to their Hardware store.

That Gebzer & Hacker, Charleston, S. C., are opening up a stock of general Hardware at Bartow, Fla.

That the Little Falls Hardware Company, Little Falls, Minn., have filed articles of incorporation.

That T. C. Fuller has purchased the Hardware stock of R. C. Smalley, Hoopeston, Ill., and has taken charge of the business.

That the Hotchkiss-Hawkins Hardware Company, with a capital stock of $50,000, have purchased the Hardware business of Bach, Cory & Co., Great Falls, Mont., and will consolidate the same with the stock carried by Hotchkiss & Hawkins, who are the heaviest stockholders in the new company. A new and larger business house will be erected at once, in order to accommodate the increased stock.

Exports.

SUPPLEMENTARY PER BARK SELKIRKSHIRE, SEPTEMBER 29, 1891, FOR SYDNEY, N. S. W.

By Tower Mfg. Company.—19 cases Hardware, 14 cases Tinware, 1 case Ironware, 3 cases Hardware, 6 cases Woodenware, 1 case Hardware, 2 cases Tinware.

By R. H. Dana & Co.—22 cases Handles, 2 cases Bolts, 2 cases Shovels and Spades, 1 case Hay Knives, 1 case Snaths, 10 cases Shovels and Scoops.

By McLean Bros. & Rigg.—2 cases Butts, 3 cases Chisels, 12 packages Hardware, 4 cases Shovels, 1 case Hammers, 22 cases Axles, 3 cases Saws, 4 cases Files, 12 cases Wheels, 1 case Whips, 1 case Trucks, 40 cases Axle Grease, 1 case Traps, 1 case Saw Sets, 12 cases Granite Ware, 18 cases Tinware, 1 box Hose, 1 case Locks, 5 cases Saws, 1 case Files, 11 cases Lanterns, 3 cases Tools, 49 cases Cartridges, 10 cases Mattocks, 3 cases Drills, 28 cases Axes, 1 case Stove Knobs, 2 cases Axles, 2 cases Axes, 1 case Braces.

By Coombs, Crosby & Eddy.—2 cases Pumps, 7 packages Choppers, 1 case Saws, 1 case Plated Goods, 1 case Tools, 1 case Hardware, 2 cases Pumps, 6 cases Handles, 1 case Saws, 2 packages Hose, 4 cases Axes, 3 packages Hatchets, 4 cases Tools, 37 cases Hardware, 66 cases Axes, 7 cases Springs, 1 case Tongs, 1 case Latches, 1 case Braces, 5 numbers Wrenches, 12 cases Axes, 11 cases Tools, 7 boxes Wheels, 6 packages Grindstone Fixtures, 5 cases Tools.

By F. B. Wheeler Company.—1 case Hardware, 65 cases Handles, 25 cases Axes, 2 cases Buggy Jacks.

By S. Guitteman & Co.—2 cases Hardware.

By William E. Peck.—1 case Agricultural Implements.

By R. W. Cameron & Co.—3 packages Hardware, 4 boxes Steam Pumps, 25 cases Handles, 60 boxes Axes, 34 cases Slates.

By R. W. Forbes & Son.—10 cases Handles, 24 cases Lawn Mowers, 17 crates Saws, 3 barrels Feed Mills.

By H. W. Peabody & Co.—5 cases Handles, 6 crates Wheels, 6 cases Hardware, 1 box Hardware, 9 cases Corn Shellers, 77 packages Handles, 8 cases Iron Castings, 10 cases Handles, 7 cases Carpet Sweepers, 11 Step Ladders, 1 case Hardware, 9 cases Handles, 3 cases Iron Castings, 1 case Hardware, 2 cases Wringers, 6 packages Corn Shellers, 38 packages Stoves, 2 cases Hardware, 6 packages Corn Shellers, 8 packages Shovels, 2 cases Rivets, 7 crates Hardware, 3 cases Stoves, 2 cases Hardware.

By W. H. Crossman & Bro.—2 packages Jacks, 8 packages Axes, 4 cases Handles, 3 cases Mattocks, 1 case Hammers, 8 cases Hardware, 35 cases Hatchets, 5 cases Cages, 4 crates Handles, 4 boxes Peck's Axes, 14 cases Shovels, 2 boxes Shovels, 12 cases Rifles, 1 case Pruners, 2 cases Cartridges, 1 case Corn Mills, 1 crate Handles, 6 cases Mattocks, 5 cases Wrenches, 44 cases Hardware, 55 packages Hardware and Pistols, 11 cases Handles, 1 case Rifles, 1 case Rifles and Reloading Tools, 2 cases Primers and Cartridges, 1 case Wrenches, 2 cases Corn Mills, 1 case Shovels, 2 cases Hatchets, 7 cases Cartridges, 1 case Shot Guns, 20 packages Axles, 3 cases Tools, 5 cases Bush Hooks, 3 crates Handles, 1 keg Braces, 1 case Hose, 1 case Broilers, 1 case Saws, 1 case Shears, 8 packages Hardware, 5 cases Seed Sowers, 3 boxes Hatchets, 1 case Handles, 2 cases Hammers, 1 case Emery Wheels, 45 cases Handles, 45 cases Hardware, 2 boxes Braces, 1 crate Banded Hose, 2 cases Egg Beaters, 2 cases Hammers, 12 cases Wrenches, 12 cases Hardware, 1 crate Handles.

PER BARK ONAWAY, OCTOBER 10, 1891, FOR PORT NATAL, SOUTH AFRICA.

By Arkell & Douglass.—7 cases Axes, 2 cases Hardware, 323 cases Plows and Parts, 28 packages Shellers, 2 cases Handles, 18 cases Hardware, 1 case Saws, 15 cases Grass Hooks, 10 packages Iron Castings, 7 cases Store Trucks, 2 cases Hay Cutters, 61 packages Shellers, 20 cases Axles, 7 cases Hardware, 75 cases Plows and Parts, 15 cases Hatchets, 6 cases Plows.

PER BRIG MOSS ROSE, OCTOBER 10, 1891, FOR PORT ELIZABETH.

By Alfred Field & Co.—1 case Rakes, 2 case Tools, 1 case Air Guns, 1 case Saws, 1 case Tools.

By Corner Bros. & Co.—2 cases Guns, 15 cases Cartridges.

By Coombs, Crosby & Eddy.—5 cases Corn Mills, 3 cases Pumps, 1 case Axes, 70 kegs Nails, 135 cases Sash Weights and Cord, 16 cases Sash Weights and Cord, 39 kegs Nails, 1 bundle Handles, 2 cases Sad Irons, 2 cases Bench Screws, 1 package Scales.

By W. H. Crossman & Bro.—95 cases Hardward, 4 cases Axles, 2 cases Bicycles, 23 cases Furniture Hardware, 199 cases Agricultural Implements, 34 cases Handles, 2 case Hose, 5 cases Wagon Springs, 3 cases Shovels, 3 crates Stoves and Parts, 1 keg Hardware.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

The market for Paints and Colors has been free from new or interesting features, and little has transpired in the markets for base materials that would arouse any unusual interest. In the latter connection about the only matters of interest are a further decline in the price of Pig Lead and some additional rise in cost of Quicksilver. With Pig Lead now comparatively low, buyers of pigment look with some curiosity for action by the corroders in the direction of a modification of prices for their productions, but the rise in Quicksilver does not appear to attract corresponding interest with respect to Quicksilver Vermilion. The movements in prices of base materials evidently possess a certain degree of interest, but it is ob-

vious that opinions as to the outcome are shaped in a great measure by the bearing they may have upon buyer or seller, and count for little until some decisive action is taken by manufacturers. For the present, fluctuations in cost of base materials are certainly not having any influence upon buyers' operations and it is apparent that, however sentiment may run, business fails to get out of the rut.

White Lead.—The distribution of this, the leading pigment, is running along very smoothly. At all events, corroders express satisfaction with the manner in which orders from local and near-by customers have dropped in, and manufacturers of the cheaper varieties also seem to be in a satisfactory frame of mind. As between the several varieties competition differs in no marked degree from what has been the rule for some time past, and evidence is wanting of any incentive for extremely aggressive action. Hence the old line of prices is generally adhered to, despite the reduced cost of crude material.

Zincs.—Domestic manufacturers of Oxide are securing Ores at somewhat lower rates, and the indications are that there will be an abundant supply for use during the balance of the year, since the market for Slab Zinc (Spelter) is in rather poor shape. However, this counts for naught as a factor bearing upon prices of Oxide, as manufacturers of the latter are well employed on old orders and securing a very fair amount of new orders, while the harmonious relations heretofore existing are maintained. On imported stock there is nothing to note but a practical repetition of previous reports, the movement of stock from first hands being of about usual volume for the season and at old prices.

Colors.—Some manufacturers note rather larger sales of Quicksilver Vermilion, a result doubtless of the rise in the price of Quicksilver, but the buying has been wholly by a few of the more active distributors, who are quick to act when indications point to a rise. Thus far the associated manufacturers have made no changes in their prices and outside firms are selling at the customary "cut." Other lines of house painters' Dry Colors are wholly devoid of new feature. Orders come along in a routine way and are filled at old prices. There is some irregularity in prices of Oil Colors and various lines of ready mixed Paints, due in a good measure to the cheapness of Linseed Oil, but as to the extent of the concessions made by manufacturers nothing tangible can be learned.

Miscellaneous.—Competition between local and out of town manufacturers of Putty continues keen and Philadelphia seems still to be on the inside track, quoting large packages 5¢ @ 10¢ and small packages 25¢ @ 30¢ ₱ 100 lbs below "inside" New York prices. Whiting and Paris White move off quite freely, chiefly on orders for delivery previous to close of navigation, and are steady at former prices. Barytes and Clays generally are unchanged.

Oils and Turpentine.

In the Oil trade the past week has been the most uneventful one experienced since the reaction from midsummer stagnation. There has been no disposition to operate on a large scale in any department, and neither export nor home trade inquiries afford encouragement to expectations of any radical change right away. To all accounts those Oils in which export operations are an important factor are considered too high in price, although lower than they were a year ago, for the placing of large orders, and in the absence of competitive foreign buying home consumers pursue an extremely conservative course. For Oils that home trade outlet alone has to be relied upon the demand is similarly hesitant, and it is the exception that anything in the nature of decided firmness to prices exists, although few changes are to go on record for the week.

Linseed Oil.—There have been no new developments this week. Rumors have had circulation to the effect that Western brands were sold at 34¢, and even less; but representatives of the leading outside crushers affirm that they have not shaded 35¢ and state that, in the present condition of the market for raw material, lower offers would not be considered. City brands remain as quoted last week, and while not wholly satisfactory to the buyers, business is of fair volume. It is probable that efforts in the direction of combining the Western crushers will be resumed ere long, but the prospect of success of the efforts is not looked upon as being particularly brilliant.

Cotton-Seed Oils.—Pending the arrival of new crop product in liberal quantities the market remains in *statu quo*, since the exceptional Mexican demand has been about satisfied. European buyers are without orders of any magnitude, and, on such as they have in hand the limit on price is below what sellers will accept at the moment. The large home consumers are also indifferent buyers, as though having little faith in the endurance of present prices. Except for moderate-sized lots there is thus only a narrow outlet, but the business passing is chiefly at steady prices. Of prime crude about 500 barrels have been sold at 30¢, and one parcel was reported at as low as 29¢. The transactions in refined were at practically the same prices that ruled a week ago.

Fish Oils.—In the New Bedford market there have been sales of about 1000 barrels crude Sperm Oil at 68¢, and 200 barrels South Sea Whale at a price not divulged. The manufactured products are selling in a jobbing way to a fair extent at old rates. On crude Menhaden, the only new item of interest is one to the effect that the late fishing has been poor and that deliveries on contracts previously made are not easy to fill in full. The Pressed and Bleached Oils are very firm, with prices higher for some varieties.

Lard Oil.—The market for this article is rather weak. Extra Winter has been sold at as low as 56¢ in exceptional instances, and present make is freely offered at 55¢, while on round lots (100 barrels or more) bids of 54¢ would probably not be passed. The lower grades are similarly irregular in price and rather slow of movement.

Miscellaneous.—No further change is noted in the market for Cocoanut Oils, and the undertone for the time being is weak. Olive Oil is handled in an indifferent manner, although comparatively low. Tallow Oil may be secured at 43¢, although quotations 5¢ above that price appear in print. Red Oils are moving off very fairly at old prices.

Spirits Turpentine.—Prices have receded to 36½¢ @ 37½¢, according to style of package, and local business at current rates is on a moderate scale. Southern advices have been stronger the past few days, however, and a turn for the better here is looked for.

At a meeting of the Pittsburgh Committee of Freight Agents, representing the various lines entering that city, held on Saturday, the 17th inst., it was decided to make a reduction in the rates on structural iron and steel and bridge material of iron and steel. The rate of this class of goods was reduced from the sixth class to the fifth class, and affects all points in the territory of Central Traffic Association. To some of the most important cities the new rates on the above goods from Pittsburgh are as follows: Chicago, 15 cents; Cincinnati, 12 cents; Cleveland, 8 cents; Cairo, 21 cents; East St. Louis, 18½ cents; Jefferson, Ind., 15 cents; Louisville, 16 cents; Oil City, 7 cents; Bradford, Pa., 8 cents; Waverly, N. Y., 13 cents; New York City, 15 cents; Nashville, Tenn., 12 cents. As stated above, the new rate goes into effect on Monday, the 26th inst.

The Leechburg Foundry and Machine Company of Pittsburgh have received an order for the erection of four plate glass machines to be placed in the new works which the Brownsville Plate Glass Company are erecting at Kensington, Pa.

Steel ties, made by the Standard Metal Tie and Construction Company of New York, were placed in the track of the Chicago and Western Indiana Railway in October, 1889. John W. Clarke, roadmaster, who placed them in the track, now makes a report upon them, of which the following is an abstract: He finds that the total expense on 1000 lineal feet of track laid with the Standard steel tie during 19 months was $45.50. The greatest part of this was expended in the first surfacing up in soft ballast to bring the steel ties to the same elevation as the wooden ties alongside. During the same 19 months the cost of labor alone on the 1000 feet of track alongside laid with wooden ties was $210.25. This was equal to a saving in labor alone sufficient to purchase 65 new steel ties. The track was exposed to a very heavy traffic, but Mr. Clarke says that the part laid with the Standard tie was "not only safe, smooth and pleasant to ride upon, but the ties were a money-saving device, and should commend themselves to railroad men from that standpoint." He adds that by reason of the rail being held rigidly upright the life of the rail was increased a good many per cent. He also observed that there was less oscillation and vibration in the engines and cars passing over them, especially in heavily-loaded cars of yielding material like grain. He believes that rolling stock would also have a longer life for these reasons.

A contract amounting to $2,500,000 has been closed with the Phœnix Iron Company by the Northeastern Elevated Railroad Company of Philadelphia for an elevated railroad five miles in length, and the rolling mills will begin work at once. The road is to be double track, and the estimated cost is $500,000 a mile. The portion first to be built will extend from Amber street, which is 2½ miles north of Market street, south. The road will be of lattice construction, thus darkening the street as little as possible. It will be built to sustain a live load of two coupled locomotives, weighing 50,000 pounds each, these followed by loaded passenger cars of 40,000 pounds each. Any weight under this will strain no part of the structure more than one-fifth its ultimate strength. The minimum hight, in the open, will be 14 feet above the street.

The suit foreclosing mortgage for $225,000 and interest since September, 1890, was instituted at Burlington on Tuesday against the McCosh Iron and Steel Company, and the appointment of a receiver prayed by the creditors.

The Secretary of the Navy on Tuesday signed a contract with the Iowa Iron Works of Dubuque, Iowa, for the construction of torpedo boat No. 2, similar to the Cushing, for the sum of $113,500. It is to be of 120 tons displacement and must be completed within one year.

The boiler works and foundry of Kratz Brothers and the architectural iron works of G. L. Mesker & Co., Evansville, Ind., have been burned. The estimated loss is $50,000; fully insured.

The L. C. Smith Automatic Ejector Gun.

The Hunter Arms Company, Fulton, N. Y., are offering the trade a gun, as illustrated in the accompanying illustrations. This is a hammerless gun, with an automatic ejector, manufactured under the American system, with American machinery, by American mechanics. The same mechanism is used which has always been a prominent feature of their hammerless gun; the addition of but five parts, which displace five parts of their regular gun, makes the ejector gun contain no more pieces than their regular hammerless gun, which is referred to as being remarkably simple. As shown in Fig. 2, the ejector mechanism comprises a pair of tumblers located in the fore end, which bear upon the wrist pins of the crank shafts, both tumblers being locked by a single sear until the breech end of the barrels are raised above the frame, when the sear is pushed out of engagement with the tumblers, and the lock or locks which have been snapped operate their respective tumblers and expel the fired cases. It is claimed that by using the main springs for the power to eject the shells it does not require any more power to open the gun to cock, or close, than their regular gun. The automatic ejector guns are made in two grades only—quality A1 and A2. The first is described as having very fine Damascus steel barrels and very fine imported English walnut stock, with fine checkering and engraving, half or full pistol grip. They are made in 10 or 12 gauge, 28–30 and 32-inch barrels. A2 is described as having finest Damascus steel barrels and finest imported English walnut stock obtainable, with finest checkering and engraving, and very finest finish. They are made half or full pistol grip, 10 and 12 gauge, 28–30 and 32-inch barrels. It is stated that especial attention is being paid to the style, hang, balence, &c., of these gums. No extra charge is made for making to order, and no extra charge for a 10-gauge over a 12-gauge. All the guns are made choke bored to shoot extremely close unless otherwise ordered. The guns are bored, if so ordered, for wads the same size as gauge of gun.

Fig. 1.—The L. C. Smith Automatic Ejector Gun.

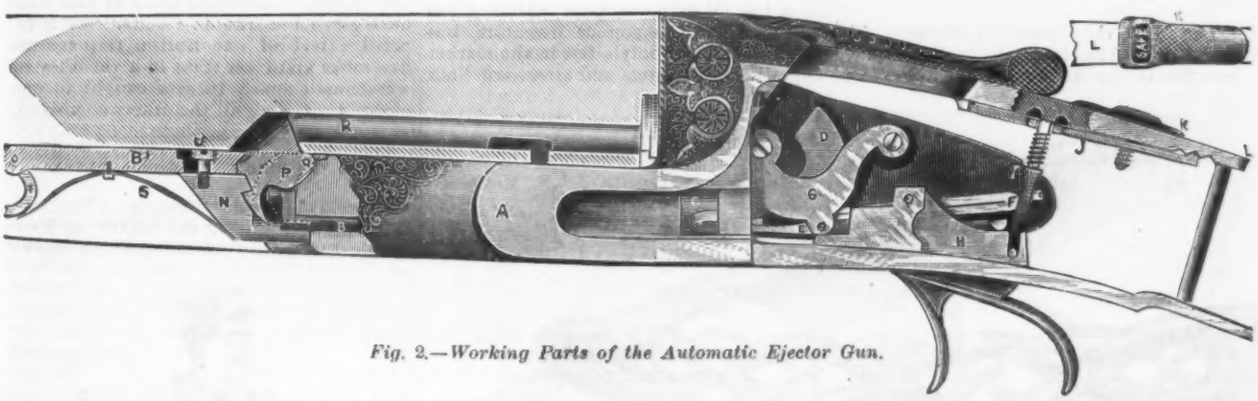
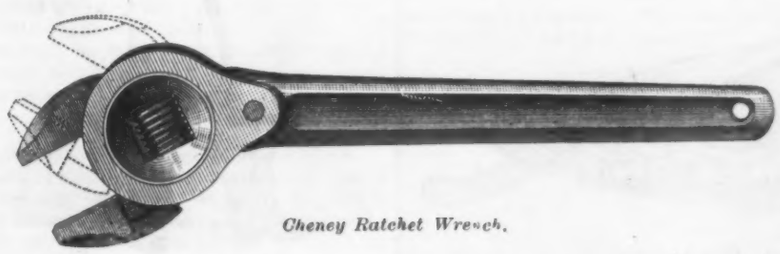


Fig. 2.—Working Parts of the Automatic Ejector Gun.

Cheney Ratchet Wrench.

C. Warren Cheney, Athol, Mass., is introducing a wrench, as illustrated herewith. This wrench is made of the best material, is nicely finished, and will be found convenient, particularly where the space to work in is limited. The advantages claimed for the wrench by the manufacturer are that the wrench is adjustable to fit different size nuts; that the handle can be set in an instant to fit any place; that the handle is the pawl, the ratchet being at the back side of the jaws; that there are no springs or screws to break, and that if there is room enough to move the handle of the wrench an inch, nuts can be turned tight or loose.



Cheney Ratchet Wrench.

Cylinder Auger Bit Case.

Irving Auger Bit Company, Wilmington, Ohio, are introducing a case which they are furnishing with their bits, as illustrated in the accompanying cuts. Fig. 1 shows the case closed, Fig. 2 shows the manner in which it is opened, while Fig. 3 represents the case reversed, giving a view of the bits. The case is made of finely polished hard wood pieces, ornamented with brass clasps and handles and lined with various colored velvets. Each case contains one set of 32½ quarters (one each of 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 sixteenths),

Fig. 1.—Cylinder Auger Bit Case.

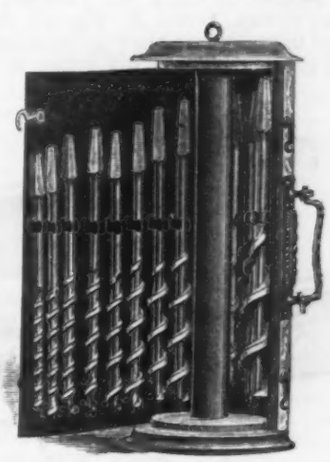


Fig. 2.—Case Partly Open.

held in place by clasps that allow the bits to be easily removed or replaced without injury to the case. The case is referred to as being neat in appearance, convenient and durable and as presenting a fine appearance as a display case. The advantage to be gained by the dealer in selling bits thus displayed and the appreciation of the mechanic in having a case both convenient and durable are points

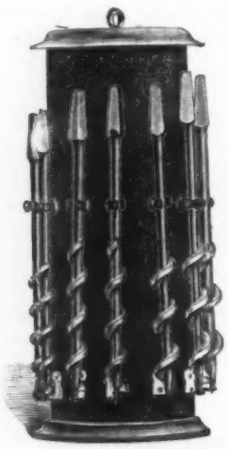


Fig. 3.—Case Entirely Reversed.

made by the manufacturers in favor of the case. No extra charges are made for sets sold in these cases, but no cases will be furnished unaccompanied by bits.

Electric Razors.

The Electric Cutlery Company, 91 Chambers and 73 Reade street, New York, are offering the trade razors the designs of

Fig. 1.—No. 62 M Electric Razor. (Design Patented.)

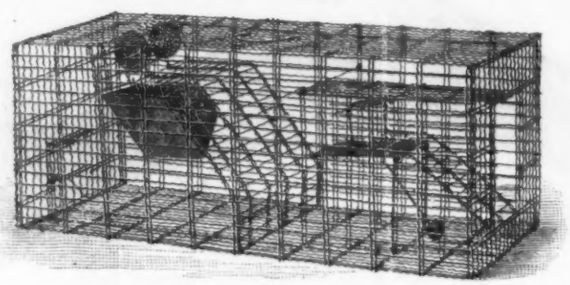
the handles of which are patented, as shown in Figs. 1 and 2. The one illustrated in Fig. 1 has a fancy polished blade, with gold etching in the center of the

Fig. 2.—No. 52 D Electric Razor. (Design Patented.)

blade. The handle is of open work pattern, showing the blade when shut in the handle. The handle is milled on the back for the fingers. Fig. 2 is a new-shaped blade, full polished throughout, with milling for the fingers and thumb. We are advised that the owl on the handle is a reproduction from a rare piece of Chinese carving, colored in imitation of the original. The other end of the handle is colored to represent a night scene, with moon and stars in metal relief. This company are making two other designs in razors, Nos. 85 N and 75 P K, which are also patented. The No. 85 N is referred to as being popular with the barber trade. One especial feature is that not having a shoulder it will hone down even when in constant use. The blade has curved milling on the back, and the handle is somewhat similar in finish to that shown in Fig. 2. The No. 75 P K has the handle finished in imitation of alligator skin. It is stated that the quality and finish of all the blades of these goods are of the finest, and that the goods are meeting with a large sale.

The Burton Patent Rat Trap.

A good rat trap which will continue to catch rats all night without resetting has been the aim of numerous inventors, but thus far there are only a few in the market which will catch rats and afterward hold them securely. The Orr & Lockett Hardware Company of Chicago have just secured the exclusive manufacture of the new Burton rat trap, and they claim that in every respect this is the ideal trap. The inventor spent months of observation before making his trap, studying the devious ways of the rodent, acquiring a practical knowledge both of how to catch a rat and then how to hold him after he was caught. An illustration of the trap is herewith given. It is of large size, having 50 per cent. more capacity then most standard traps, being 22 inches long, 9 inches wide and 9 inches high. Its rectangular form enables it to be packed closely. It is constructed of wire and has two compartments, one being called the receiver and the other the collector. Bait is put in both compartments. The rat in entering goes up an incline and steps on a hinged platform of smooth sheet iron, which gives way under his weight and drops him in the receiver. The platform is weighted so



The Burton Patent Rat Trap.

that it swings back into position immediately, and it is also connected by an automatic attachment with an overhanging door, which is pulled down if the rat endeavors to climb out over the platform, and effectually shuts him in. From the receiving department another incline leads to a chute over the collecting department, through which the rat passes in endeavoring to escape. The chute has a swinging door at the bottom, which only opens downward. Repeated trials of this trap have given remarkable results. A competitive test of one Burton trap against five other first-class traps in a rat-infested warehouse showed 16 rats caught in one night, surpassing all the others combined.

The Mechanics' Handy Apron.

Cleveland Novelty Company, Cleveland, Ohio, are introducing this article, as illustrated herewith. It is made of heavy

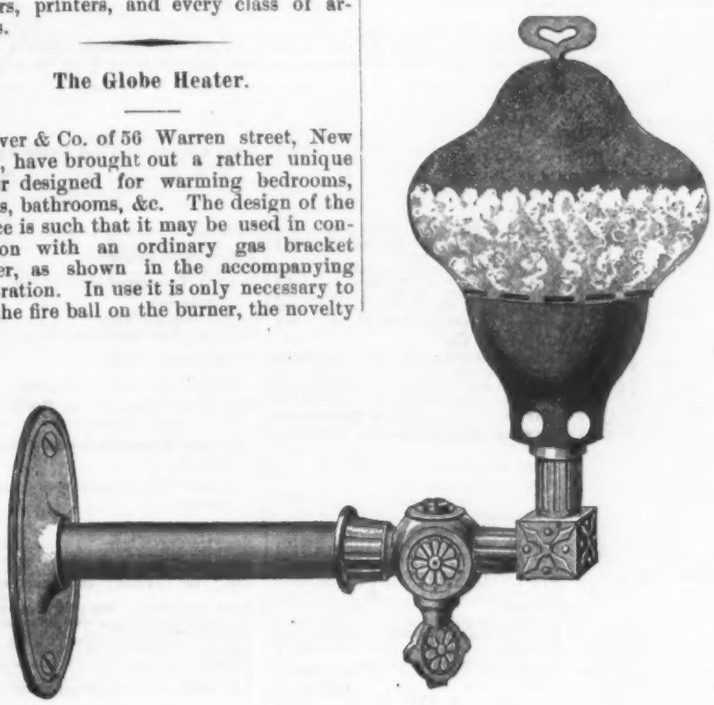
The Mechanics' Handy Apron.

canvas, with tool, nail and rule pockets. The claims are made that it is adjustable, one size fitting any one; that it will wear a lifetime; that it does not interfere with climbing or working in any position; that

when kneeling it protects the knees, and that it is as convenient to wear as a pair of pants. It is recommended for use by carpenters, lathers, machinists, masons, tinners, printers, and every class of artisans.

The Globe Heater.

Silver & Co. of 56 Warren street, New York, have brought out a rather unique heater designed for warming bedrooms, offices, bathrooms, &c. The design of the device is such that it may be used in connection with an ordinary gas bracket burner, as shown in the accompanying illustration. In use it is only necessary to rest the fire ball on the burner, the novelty consisting in the peculiar construction of the globe and in coverting an ordinary gas flame into a powerful atmospheric burner. The globe is so arranged, the manufacturers state, that when the gas enters it mixes 10 parts of air with each part of gas, and while the mixed gases are in the chamber they are subjected to an intense heat. This action greatly expands them and forces them out through small openings around the sides of the globe, at which points the gases are lighted. The solid blue flame resulting will give, it is claimed, such an intense heat that the surface of the globe becomes red hot. The cost of the gas is said to be less than 1¼ cents per hour.



The Globe Heater.

Monitor Sad Iron.

Stewart & Baker, 107 State street, Rochester, N. Y., are introducing a loose-handled sad iron, as illustrated herewith. The handle is hooked to the top of the iron in the center, while depressions on either end of the top receive the bearings on the handle, holding the handle firmly in place. In attaching the handle, Fig. 2, the thumb is pressed against the knob of the lever, and the handle placed in position on the iron. When the thumb is removed, the handle locks itself in place by the action of a flat steel spring upon the thumb lever. The irons are sold in sets of three, with one handle and a stand, one of the irons being a polisher. The irons are neat in appearance and well finished.

Fig. 1.—Monitor Sad Iron.

Fig. 2.—Attaching the Handle.

The United States Warehousemen's Association was organized last week in Chicago. Thirty-five cities, including New York, San Francisco, St. Paul and New Orleans, were represented. The purpose is to establish such a system of business among warehousemen that "a Kansas City merchant who may have goods stored in a Chicago warehouse can obtain a loan from his home bank on the receipt, because the bank will be assured that the warehouse is reliable. A Chicago merchant can then buy goods by warehouse receipt in Kansas City, and feel certain that he will get what the voucher calls for."

CONTENTS.

CURRENT HARDWARE PRICES.

OCTOBER 21, 1891

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers Prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.
Domestic ..... ₩ doz $3.00, 33⅓%
Excelsior ..... ₩ doz $10.00 ..... 50&10&2%
Washburn's Self-Locking ..... 20@20&10%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils.
Eagle Anvils, ₩ ℔ 10¢ ..... 15@15&5%
Peter Wright's ..... 11@11½¢
Armitage's Mouse Hole ..... 10½@11¢
Armitage's Mouse Hole, Extra ..... 12@12½¢
Trenton ..... 10@10½¢
Wilkinson's ..... 10½@11¢
Moore & Barnes Mfg. Co 33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00 ..... 20%
Cheney Anvil and Vise 25%
Allen Anvil and Vise, $8.00 ..... 40&10%
Star ..... 45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—
Douglass Mfg. Co. } 70&10@70
Wm. A. Ives & Co. } &10&5%
Humphreysville Mfg. Co. }
French, Swift & Co. (F. H. Beecher, P. S. & W. Co. }
Rockford Bit Company }
Cook's, Douglass Mfg. Co 55%
Cook's, N. H. Copper Co. 50&10@50&10&5%
Ives' Circular Lip 60%
Patent Solid Head 30%
C. E. Jenning & Co., No. 10, extension lip 40%
C. E. Jennings & Co., No. 30 ..... 60%
C. E. Jennings & Co., Auger Bits, ₩ set, 33⅓ quarters, No. 5, $5; No. 30, $5.50 ..... 20%
Lewis' Patent Single Twist 45%
Russell Jennings' Augers and Bits ..... 25&10%
Imitation Jennings' Bits ..... 60@60&10%
Pugh's Black 20%
Car Bits ..... 60@60&10%
Car Bits, P. S. & W. Co ..... 60&10%
Snell's Car Bits 60%
L Hommedieu Car Bits ..... 15&10%
Forstner Pat. Auger Bits 20%
Cincinnati Bell-Hangers' Bits ..... 30&10%

Bit Stock Drills—
Morse Twist Drills ..... 50&10&5%
Standard ..... 50&10&5%
Cleveland ..... 50&10&5%
Syracuse, for metal ..... 50&10%
Syracuse, for wood (wood list) ..... 30@30&5%
Cincinnati, for wood ..... 30&10%
Cincinnati, for metal ..... 45&10%

Expansive Bits—
Clarks' small, $18; large, $26 ..... 35@35&10%
Ives' No. 4, ₩ doz $60 ..... 40%
Swan's 40%
Steer's, No. 1, $25; No. 2, $23 ..... 35%
Stearns' No. 2, $48 ..... 30%

Gimlet Bits—
Common ..... ₩ gross $2.75@3.25
Diamond ..... ₩ doz $1.10 ..... 25&10%
Bee ..... 25@25&5%
Double Cut, Shepardson's ..... 45@45&10%
Double Cut, Ct. Valley Mfg. Co ..... 30&10%
Double Cut, Hartwell's, ₩ gro 35.25
Double Cut, Douglass' ..... 40&10%
Double Cut, Ives' ..... 60@60&10%

Hollow Augers—
Ives ..... } 33⅓@
French, Swift & Co. ..... } 33⅓&10%
Douglass' }
Bonney's Adjustable, ₩ doz $48 ..... 40&10%
Stearns' ..... 20&10%
Ives' Expansive, each $4.50 ..... 50&5%
Universal Expansive, each $4.50 ..... 20%
Wood's ..... 25@25&10%
Cincinnati Adjustable ..... 25&10%
Cincinnati Standard ..... 25&10%

Ship Augers and Bits—
L'Hommedieu's ..... 15&10@15&10&5%
Watrous' ..... 15&10@15&10&10%
Snell's ..... 15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls—
Awls, Sewing, Common ..... ₩ gr $1.70, 45%
Awls, Should. Peg, ₩ gr $2.45, 50@50&10%
Awls, Pat. Peg ..... ₩ gr 63¢ ..... 50@50&10%
Awls, Shouldered Brad ..... 2.70 ₩ gr 35%
Awls, Handled Brad ..... $7.50 ₩ gr 45%
Awls, Handled Scratch ₩ gr, $7.50 ..... 35&10%
Awls, Socket Scratch, ₩ doz, $1.50 ..... 35@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00 @	$7.50
First qual., other brands	6.62½ @ 6.75	
Second quality	6.00	6.50

Axle Grease—See Grease, Axle.

Axles—
No. 1, 4½¢@5¢, No. 2 5½¢@6½¢
Nos. 7 to 14 ..... 55&5% } 3% cash
Nos. 15 to 18 ..... 47½% }
Nos. 19 to 22 ..... 70% }
Concord Axles, loose collar ..... 5¢@6¢
Concord Axles, solid collar ..... 6¢@7¢
National Tubular Self-Oiling ..... 33⅓&10@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—
Spring Balances 40%

No.	2000	20	30
Chatillon, ₩ doz	$0.80	0.95	1.75 net

Chatillon Straight Balances 40%
Chatillon Circular Balances ..... 50&10%

Barb Wire.—See Wire, Barb.

Bars.
Crow—
Cast Steel ..... ₩ ℔ 3½¢
Iron, Steel Points ..... ₩ ℔ 3¢

Basins, Wash—
Standard Fiberware, No. 1, 10½-inch, $3; 12-inch, $2.25; 13½-inch, $3.75; 15-inch, $3.25.

Beams, Scale—
Scale Beams, List Jan. 12, '82 ..... 50&10@50&10&5%
Chatillon's No. 1 ..... 40%
Chatillon's No. 2 ..... 50%
Custer's 33⅓%

Beaters—
Egg—
Dover ..... ₩ doz $1.50
Duplex (Standard Co.) ..... ₩ doz $1.25
Rival (Standard Co.) ..... ₩ doz $1.00
Duplex Extra Heavy (Standard Co.) ..... ₩ doz $3.50
Bryant's ..... ₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2 ..... $36.00
Easy (H. & R. Mfg. Co.) ..... ₩ gro $12.00
Triple (H. & R. Mfg. Co.) ..... ₩ gro $16.50
Spiral ..... ₩ gro $4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.) ..... ₩ gro $9.00
Paine, Diehl & Co.'s ..... ₩ gro $24.00
Silver & Co ..... ₩ doz $5.50

Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2 ..... 20%

Bells—
Cow—
Common Wrought ..... 60&10%
Western ..... 30&10%
Western, Sargent's list ..... 70&10%
Kentucky, "Star" ..... 30&10%
Kentucky, Sargent's list ..... 70&10%
Kentucky Durham ..... 70&10
Dodge, Genuine Kentucky ..... 70@70&10%
Texas Star ..... 50&10@50&10&5%

Door—
Gong, Abbe's ..... 33⅓&10%
Gong, Yankee ..... 45&10%
Gong, Barton's ..... 40&10@50%
Crank, Taylor's ..... 25&10%
Crank Brooks' ..... 50&10&2%
Crank Cone's 10%
Crank, Connel's ..... 20&10%
Lever, Sargent's ..... 60&10%
Lever, Taylor's Bronsed or Plated ..... net
Lever, Taylor's Japanned ..... 35&10%
Lever, R. E. M. Co.'s ..... 50&10&2%
Pull, Brook's ..... 50&10&2%

Electric,
Wollensak's 20%
Bigelow & Dowse 20%
Taylor's 20%

Hand—
Light Brass ..... 75&10%
Extra Heavy ..... 65&10%
White Metal ..... 60&10&10%
Silver Chime ..... 33⅓&10%
Globe Cone's Patent) ..... 35&10@35%

Miscellaneous—
Call ..... 40@40&5%
Farm Bells ..... ₩ ℔ 34@34½¢
Steel Alloy Church and School Bells 40%

Bellows—
Blacksmiths' ..... 60&5@65%
Molders' ..... 40@40&10%
Hand Bellows ..... 40&10@50%

Belting, Rubber—
Common Standard ..... 70@70&10&5%
Standard ..... 70@70&5%
Extra ..... 60@60&10%
N.Y.B.&P.Co., Carbon 60%
N.Y.B.&P.Co., Diamond 50%
N.Y.B.&P.Co., Para 40%

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire.
Stoddard's Lightning Tire Upsetters 15%
Detroit Perfected Tire Bender 15%

Bits—
Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—
Ordinary Tackle, list May 20, 1889 ..... 70&5@70&10%
Cleveland Block Co., Mal. Iron 50%
Moore's Novelty, Mal. Iron 50%
Sure Grip Steel Tackle Blocks 25%

Boards, Stove.
Wood Lined Crystal 50%
Oxidized 45%
Embossed 50%
Paper Lined Zinc 55%
Crystal 55%
Embossed 55%
New Tacoma 55%

Bolts—
Carriage, Machine, &c.—
Com. list June 10, '84 ..... 75&10&2%
Genuine Eagle, Norway, list Oct., '84 ..... 80 @80&10%
Phila. pattern, list Oct. 7, '84 ..... 75@75&10%
R.B.&W., old list 70%
Machine, list Jan. 1, 1890 ..... 75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890 ..... 75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c. ..... 70@70&10%
Cast Iron Shutter Bolts ..... 70@70&10%
Cast Iron Chain (Sargent's list) ..... 65&10%
Ives' Patent Door Bolts ..... 60&10@60&10&5%
Wrought Barrel ..... 70@70&10%
Wrought Square ..... 70@70&10%
Wr't Shutter, all Iron, Stanley's ..... 60&10%
Wr't Shutter, Brass Knob, " ..... 40&10%
Wr't Shutter, Sargent's list ..... 60&10%
Wr't Sunk Flush, Sargent's list ..... 55&10%
Wr't Sunk Flush, Stanley's list ..... 50&10%
Wr't B.K.Flush. Com'n " ..... 55&10%

Stove and Plow—
Stove 60%
Plow ..... 60&5%
R. B. & W., Plow 55%

Tire—
Common, list Feb. 28, '83 ..... 65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83 ..... 65%
Keystone, Philadel., list Oct. '84 ..... 80%
Norway, Phila., list Oct. '84 ..... 75%
American Screw Company:
Norway, Phil., list Oct. 16, '84 ..... 75%
Eagle, Phil., list Oct. 16, '84 ..... 80%
Philadel., list Oct. 16, '84 ..... 80%
Bay State, list Feb. 28, '83 ..... 65%
R.B.&W., Philadel., list Oct. 16, '84 ..... 80%

Borers, Tap.
Common and Ring ..... 20&10%
Ive's Tap Borers ..... 33⅓&5%
Enterprise Mfg. Co ..... 20&10@30%
Clark's ..... 33⅓@35%

Borax ..... ₩ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.
Per ℔ ..... 2¾¢

Braces.—
American Bit Brace Co.:
Nos. 10, 12, 20 ..... 60&10%
Nos. 11, 21, 24, 27 ..... 70&10%
Nos. 22, 23, 25 ..... 60&10&5%
Nos. 13, 26, 36, 37 ..... 70&10&5%
Ball Braces, net ..... $1.12 to $1.25
Amidon's
Barker's Imp'd Plain ..... 75&10@80%
Barker's Imp. Nickeled ..... 65&10@70%
Ratchet ..... 75&10@80%
Eclipse Rachet 60%
Globe Jawed ..... 40@40&10%
Corner Brace ..... 40@40&10%
Universal, 8 in., $2.10 10 in. $2.35
Buffalo Ball ..... $1.10@$1.15
Barber's,
Nos. 10 to 16 ..... 50%
Nos. 30 to 33 ..... 50%
Nos. 40 to 63 ..... 50&10%
Saxton's,
Barker's Imp. Polished ..... 75&10@80%
Barker's Imp. Nickeled ..... 65&10@70%
Ratchet, Polished ..... 50&10@60%
Ratchet, Nickeled ..... 40&10@50%
Buffalo Ball ..... net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30 ..... 50&10@60&5%
Nos. 117, 118, 119 ..... 70@70&5%
Common Ball, American ..... $1.00@$1.10
Fray's Genuine Spofford's ..... 50&5@50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ..... 50&10%
Ives' New Haven Novelty ..... 70@70&5%
New Haven Ratchet ..... 60&5@60&10%
Barber Ratchet ..... 60&5@60&10%
Barbers ..... 60&5%
Spofford ..... 60&5@60&10%
Osgood's Ratchet ..... 40&10@50%
P. S. & W. Co., Peck's Patent 60%

Brackets—
Shelf plain, Sargent list, 55&10@55&
10&10%
Shelf, fancy, Sargent's list, 60&10@60
&10&10%
Reading, plain ..... 50&10@60&10&5%
Reading, Rosette ..... 60&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-	Inch	9	10	9x11
Basting.	Per doz	$4.50	5.50	6.50

New Haven 50%
Wire Goods Co ..... 65&10%

Buckets, Well.
Galvanized—
Hill's ..... ₩ doz, 12 qt, $4.25; 14 qt, $5.2
Iron Clad ..... ₩ doz. 14 qt, $4.25@$4.5
Helwig's Flat Iron Band $3.75
Helwig's Wired Top ..... ₩ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—
Brass—
Wrought Brass ..... 75&10@80%
Cast Brass, Tiebout's 80%
Cast Brass, Fast ..... 33⅓&10%
Cast Brass, Loose Joint ..... 33⅓&10%
Cast Iron—
Fast Joint, Narrow ..... 50&10&5@60%
Fast Joint, Broad ..... 50&10@60%
Loose Joint } .70&10
Loose Joint, Japanned } @75%
Loose Joint, Jap. with Acorns }
Parliament Butts }
Mayer's Hinges }
Loose Pin, Acorns }
Loose Pin, Acorns, Japanned }
Loose Pin, Acorns, Japanned, Plated Tips }
Wrought Steel—
Fast Joint, Narrow } .70&10
Fast Joint, Lt. Narrow } @75%
Fast Joint, Broad }
Loose Joint, Broad }
Table Butts, Back Flaps, &c }
Inside Blind, Regular }
Inside Blind, Light }
Loose Pin }
Bronsed Wrought Butts 50%

Calipers—See Compasses.

Calks, Toe—
Gautier, One Prong, Blunt ..... 5½@6¢
Burke's, One Prong, Blunt ..... 5½@6¢
Burke's, Two Prong, Blunt ..... 7½@8¢
Burke's, One Prong, Sharp ..... 6½@7¢

Can Openers—See Openers, Can.

Caps—
Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's ..... 35@37¢
E. B. Trimmed Edge, 1-10's ..... 47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's ..... 47@50¢
Musket Waterproof, 1-10's ..... 50@53¢
G. D ..... 27@30¢
S. B. Genuine Imported ..... 45¢
Eley's E. B. ..... 56¢ @ 58¢
Eley's D Waterproof, Central Fire $1.60

Primers—
Berdan Primers, $1.00 ..... 3%
B. L. Caps (for Sturtevant Shells) $1.00 ..... 3%
All other Primers, $1.20 ..... 3%

Cards—List January 28, 1891.
Watson's Cotton, Wool, Horse and File 33%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—
Rim Fire Cartridges ..... 50&5&2%
Rim Fire Military ..... 15&2%
Cent. Fire, Pistol and Rifle ..... 35&5&2%
Cent. Fire, Military and Sporting ..... 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75 ..... 2%
Blank Cartridges, 32 cal., $3.50 ..... 2%
Primed Shells and Bullets ..... 15&5&2%
S. B. Caps, Round Ball, $1.75 ..... 2%
S. B. Caps, Con. Ball, Swgd., $2.00 ..... 2%

Casters—
Bed ..... } Brass ..... 55&55&10%
Plate ..... } Others ..... 50@60&10%
Shallow Socket ..... }
Deep Socket ..... 40&10%
Yale Casters, list May, 1884 ..... 30&10@40%
Yale, Gem ..... 50@50&5%
Martin's Patent (Phœnix) ..... 45&10@50%
Payson's Anti-friction ..... 60@60&10%
Giant Truck Casters 30%
Stationary Truck Casters ..... 50&10%
Socket Truck Casters 50%

Cattle Leaders—See Leaders, Cattle.

Cement.
Victor Elastic ..... 5 ℔ pails ₩ ℔

Chain—
Trace, Wagon and Fancy Chains, List revised April 21, 1890 ..... 60@60&5%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ½¢@1½¢ ₩ ℔.
German Coil, list Oct. 6, 1890 ..... 60@60&5%
German Halter Chain, list Oct. 6, 1890 ..... 60@60&5%
Covert Halter ..... 60&2%
Covert Traces ..... 35&2%
Covert Heel Chain ..... 50&2%
Oneida Halter Chain ..... 60@60&5%
Galvanized Pump Chain ..... ₩ ℔ 5½¢@6¢
Jack Chain, Iron ..... 75&10@80%
Jack Chain, Brass ..... 75@75&10%

Chalk—
White, case lots, ₩ gr 50¢; small lots 55 @55¢
Red, case lots ..... ₩ gr 67¢; small lots 77 @78¢
Blue, case lots ..... ₩ gr 75¢; small lots 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W. } ..75 @ 75&10%
New Haven }
Witherby }
Mix }
Ohio Tool Co }
Douglass ..... 75@75&5%
Buck Bros 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 50@30&5%
Tanged and Miscellaneous.
Tanged Firmers ..... 40&10@50%
Butchers' ..... $4.75@$5.00
Spear & Jackson's ..... 55 to 5
Buck Bros 30%
Cold Chisels, ₩ ℔ ..... 15@16¢

Chucks—
Beach Pat ..... each, $3.00 ..... 30%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Bals Pat 25%
Graham Patent 33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.,
Victor $3.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns.
Tiffin Union, each, 5 gal. $2.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each, 6 gal., $2.60; 10 gal., $2.75 15 gal. $3.00 20 gal. $3.25

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Parallel, C. H. Besly & Co.....25%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.
Butchers'.
Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16..55&5%
Superior Axle Clips.....66%&5@70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₩ lb, 5¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....25%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2½

Coffee Mills—See Mills, Coffee

Collars, Dog, &c.
Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list.....30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.
Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%
Kellogg's.....50&10
Sweet & Clark's.....50&10

Compasses, Dividers, &c.—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord—
Sash.
Common.....₩ lb, 10¢ @ 11¢
Patent, good quality.....₩ lb, 12 @ 12¢
White Cotton Braided, fair, ₩ lb, 24½@25¢
Common Russia Sash.....₩ lb, 12½@13¢
Patent Russia Sash.....₩ lb, 14¢
Cable Laid Italian Sash.....₩ lb, 21@22¢
India Cable Laid Sash.....₩ lb, 12¢
Silver Lake—
A Quality, White, 50¢.....25 %
A Quality, Drab, 55¢.....25 %
B Quality, White, 30¢.....10 %
B Quality, Drab, 35¢.....10 %
Sylvan Spring Extra Braided White,34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....28¢
Massachusetts, White.....30¢
Samson—
Braided, White Cotton, 50¢...30@30&5%
Braided, Drab Cotton, 55¢...30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%
Tate's Cotton Braided, White...₩ lb, 28¢
Wire Picture.
Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50&5&2@50&10&2%

Crayons.
White Crayons, ₩ gross.....10¢
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain.

Cutters—
Meat.
Dixon's ₩ doz.....40&5%
Nos..... 1 2 3 4
$14.00 $17.00 $19.00 $40.00
Woodruff's ₩ doz.....40&5%
Nos..... 100 150
$15.00 $18.00
Hales Pattern ₩ doz.....70@70&5%
Nos..... 11 12 13
$27.00 $33.00 $45.00
American.....30%
Nos..... 1 2 3 4 B 5
Each.....$5 $7 $10 $25 $50 $60
Enterprise.....30%
Nos..... 10 12 22 32 42
Each.....$2 $2.50 $4 $6 $15
Great American Meat Cutter.....30%
Nos..... 112 116 118 120 122
Each.....$2.00 $2.75 $3.00 $2.50 $4.00
Miles' Challenge ₩ doz.....45@45&10%
Nos..... 1 2 3
$22.00 $20.00 $40.00
Home No. 1.....₩ doz $26.00, 5&2½%
Draw Cut, each:
Nos. 6 2 6 8
$50 $75 $80 $235 .....20@25%
Great American.....30%
Beef Shavers (Enterprise).....20&10@30%
Little Giant (P. S. & W. Co.).....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00
Tobacco.
Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%
Washer.
Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's.₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—
Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. 15.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00,
50&5@50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50¢
Imperial, ₩ doz $15.....45%

Dividers—
See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.
Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,30%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....30@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85
Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—See Pans, Dripping.

Drivers, Screw.
Douglas Mfg. Co.....20@20&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
P. S. & W.....70 %
Knapp & Cowles:
No. 1.....60&20@70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos. 4 and 00, Acme and Ideal..50& 5&50&10&5%
Stearns'.....35&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits....30@30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 8, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour, CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ lb.....	4½¢	5 ¢	2½¢
½ kegs, ₩ lb.....	4½¢	5½¢	2¾¢
¼ kegs, ₩ lb.....5 ¢		5½¢	3 ¢
10-lb cans, 10 in case.....6 ¢		6½¢	5 ¢
10-lb cans, less than 10.....10 ¢		10 ¢	7½¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.
List No. 5.
Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Extractors, Lemon Juice—See Squeezers, Lemon.

Fasteners, Blind—
Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....new lis.
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $50.00.....20&10%
Lane's, ₩ doz $46.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—
Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds)....75% (extra prices on certain sizes)
G. & H. Barnett (Black Diamond).....
Imported—
Eagle.....60&10&5@60&10&10%
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.
Grindstone—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—
Hay, Manure, &c., Asso List..65&5@65&10%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames—
Saw—
White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%
Screen, Window and Door—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@33⅓&10%
Stearns' Frames and Corners..25@25&10%
Cortland.....40@40&5%

Freezers, Ice Cream—
White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&2½
Shepard's Lightning.....65@65&2½
Gem.....60%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless.....60&10%
Giant.....60%
Zero.....60&10&10%
Boss and Put.....&10&10&10%
Keystone, P. D. & Co., each $1.50.....30%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.
Gersdorff's Perfection, Standard and Globe; Tin, 1 gro., 10 %; 2 to 5 gro., 20 %; 6 to 10 gro.....20 %
Copper, 1 to 6 doz., 15 %; 6 to 12 doz., 20 %; over 12 doz.....25 %

Furnaces, Soldering.
Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. 3 Gem, copper reservoir, 5.50

Fuse—Dis. 12½%. ₩ 1000
Common Hemp Fuse, for dry ground.$3.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.35
Double Taped Fuse, for very wet gr.. 4.35
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—
Stebbin's Pattern.....80@80&5%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....30%
Lincoln's Pattern.....70@70&10%
Weed's.....20&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch.....25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45&45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₩ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Improved Process.....35@35&5%

Glue Pots—See Pots, Glue.

Grease, Axle.
Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—
Small, at factory.....₩ ton $7.50@9.00
Family, Cleveland Stone Co.....20 %

Grindstone Fixtures—See Fixtures Grindstone.

Hack Saws—See Saws.

Hafts. Awl.
Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top. ₩ gr $10.00...45&10%
Pat. Peg, Leather Top. ₩ gr $12.00..45&10%

Halters.
Covert's, Rope, Jute.....6 3&10&10&2%
Covert's, Rope, 7-16-in., Jute.....70&2%
Covert's, Rope, ¼-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....35&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Vernes.....50@50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail...40&12½%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Hartford, Nail Hammers.....40&5%
Hartford, Machinists, &c...50&5@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@20
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 lb and under..₩ lb 40¢ / 3 to 5 lb.....₩ lb 36¢ / Over 5 lb.....₩ lb 30¢ } 70@70&10%
Wilkinson's Smiths.....10½¢@11¢₩ lb

Handcuffs and Leg Irons—See Police Goods,

Handles—
Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₩ pair, 28¢; No. 3 13¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢.....60%
Champion.....10%
Iron, Wrought or Cast—
Door or Thumb.
Nos..... 0 1 2 3 4
Per doz....$0.90 1.00 1.10 1.35 1.50 60&10&10%
Boggin's Latches.....₩ doz 30¢@35¢
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.52 Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70%
Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50 / Hickory Firmer Chisel, large. ₩ gr 5.00 } 50%
Apple Firmer Chisel, ass'd...₩ gr 5.00 / Apple Firmer Chisel, large...₩ gr 6.00 } 50%
Socket Firmer Chisel, ass'd...₩ gr 5.00 / Socket Framing Chisel, ass'd. ₩ gr 5.00 } 50%
I. S. Smith & Co.'s Pat File.....50%
File, assorted.....₩ gr 2 75
Auger, assorted.....₩ gr 5.00 } 50%
Auger, large.....₩ gr 7.00
Pat. Auger, Ives'.....20&10%
Pat. Auger, Douglass.....₩ set $1 25
Pat. Auger, Swan's.....₩ set $1 00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling.....50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₩ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₩ ft, 10¢.....50&15@60%
Carrier Steel Anti-Friction.....60&10%
Architect, ₩ set $6.00.....20%
Eclipse.....20&10%
Felix, ₩ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Lane's Parlor.....40%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₩ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....45%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's
Hunt's
Hurd's
Mann's
Peck's
Underhill's
} 40 & 10 @ 50&5%
Buffalo Hammer Co.
Fayette R. Plumb.
C. Hammond & Son...
Kelly's.
Sargent & Co.
P., S. & W. Co.
Ten Eyck Edge Tool Co.
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Huffer.....50%
Clark's, Nos. 1, 2, 3, 5, 40 and 50.....75&10&5@30%
Clark's Mortise Gravity.....50%
Sargent's Nos. 1, 3, 5, 11, 13.....75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible...70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₩ doz $4.40, 60%
N. E.....₩ doz $7.00, 55%
F. E. Reversible.....₩ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₩ doz $5.00, 55&10%
Automatic.....₩ doz $12.50, 50%
Common Sense.....₩ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₩ doz $12.00, 50%

Spring Hinges—

Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March 1886.....30%
Acme.....30%
C. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Stearn's.....50&10%
Niagara, Holdback pattern, per gross.....$14.00

Wrought Iron Hinges
List February 14, 1891.
Strap and T.....50&10%
Corrugated Strap and T.....50 & 10 %
Screw Hook and Strap.....{ 6 to 12 in., ₩ D. 4¢ / 14 to 20 in., ₩ D. 3½¢ / 22 to 36 in., ₩ D. 3¢
Screw Hook and Eye.....{ ⅛ in., ₩ D 7½¢ / ⅜ in., ₩ D 5½¢ / ¾ in., ₩ D 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₩ D .....5¢ / over 12 in., ₩ D .....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat.,
Am. Axe and Tool Co., S. & O. Pat.
} 50&10&5 @60%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton &c.....70%
Warren Hoe.....60%
Magic.....₩ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₩ doz $18.....60%

Bit.

Extension,
Barber's, ₩ doz $15.00.....40@40&10%
Ives, ₩ doz $20.00.....60&5@60&10%
Diagonal.....₩ doz $24.00, 40%
Angular.....₩ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₩ doz $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list.
} 60&10&10%
60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list.
Coat and Hat, Reading.
55&10@60&10%
50&10@50&10&10%

Wrought Iron—

Cotton.....₩ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks).
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. 30%
See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....60%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt.....80@80&10%
Atlas, Coat and Hat.....60%
Bright Wire Goods, see *Wire.*

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₩ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....40&10@60%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee....40&10 @ 60%

Huskers—

Blair's Adjustable.....₩ gr $8.00
Blair's Adjustable Clipper....₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₩ 100 ℔, $2.30@$2.40
Self-Heating.....₩ doz $9.00 net
Self-Heating, Tailors'....₩ doz $18.00 net
Mrs. Pott's Irons.....60@60&10%
Enterprise Star Irons.....60@60&10%
XX Cold Handle Sad Iron.....50&5@60%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25%
B. B. Sad Irons, ₩ ℔.....3 @3½¢
Combined Fluter and Sad Iron, ₩ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₩ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....5¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓ %
National Self-Heating.....30 %

Soldering—

Soldering Coppers.....₩ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....40%
Victor.....40%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld. W.M. list Jan. 1, '91.20%
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₩ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, List Dec. 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's A.A.I, Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ₩ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Corn—

Bradley's.....10%
Wadsworth's.....25%

Drawing—

Witherby
P. S. & W
Mix
New Haven
} .75 @ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$3.00 @ $3.00
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₩ doz $11.00@$11.50
Heath's.....₩ doz $13.00@$15.50
Auburn Hay, Corn, and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₩ doz. $7.00 @ $8.00

Mincing.

Am. (2d quality), ₩ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₩ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₩ doz $3.00 .25%
Buffalo Double Adj'table, ₩ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885..40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&25%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladles—

Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₩ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₩ doz.....$3.75@4.00
Lift Wire, with Guards.....$4.00@4.25
Square Plain, with Guards....$3.75@4.00
Sq. Lift Wire, with Guards.....$4.50

Police Lanterns (including packages).

2¾-inch Bull's-eye Police regular. ₩ doz $3.60
3-inch Bull's-eye Police regular. ₩ doz $3.90
2¾-inch Bull's-eye Police flash light. ₩ doz $4.00
3-inch Bull's-eye Police flash light. ₩ doz $4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Feb. 20, 1891.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10& %
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....30%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....50%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro.....30%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 12 16 20
100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ doz $7.50, 20%

Links, Open.

Terry's—per gro.:
Nos..... 1 2 3 4
$6 00 8.00 12.00 16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, re. Jan. 1, '85..33½&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889.....65&10@7(%
Mallory, Wheeler & Co., list July, '88.....Much lower net prices often made.
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88,
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....20%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list....70&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....40%
Horseshoe.....₩ doz, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian. Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 1010 line.....85&5%
No. 41 line.....45&10%
No. 61 line.....50&5%
No. 21 line.....75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₩ gr..33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated ₩ gr $10.00
Universal.....40%
Kempshall's Gravity.....50@50&10%
Kempshall's Model.....50@50&10%
Corbin's Daisy, list Feb. 15, 1886...70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Liesche's, No. 100, ₩ gr $8; 105, $10..30%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list January, 1889..70%
Security.....70%
Buckeye.....₩ gro $4.50

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₩ doz, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	50%
Snell's, Rice's Pat.	5.50	6.75	40&10%
Jennings	5.50	6.75	45@45&10%
Other Machines...	2.35	2.75	
Phillips' Patent with Augers	7.00	7.50	
Miller's Falls	7.50		25%

Fluting.

Knox, 4¼-inch Rolls.....$3.25 each } 25%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll, $2.15.....25%
Eagle, 5¼-inch Roll, $2.85.....25%
Crown, 4¼ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....25%
Crown Jewel 6 in.....$3.50 each, 25%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....25%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₩ doz ($8 00).....40%
Shepard Hand Fluter, No. 110 ₩ doz $11.00.....40%
Shepard Hand Fluter, No. 98 ₩ doz $6.00.....40%
Clark's Hand Fluter, ₩ doz $15.00.....25%
Combined Fluter and Sad Iron, ₩ doz $15.00.....30%
Buffalo ₩ doz $10.00.....10%

Hoisting—

Moore's Hand Hoist, with Lock Brake.....30%
Moore's Differential Pulley Block....40%
Emery Mfg. Co's.....25%
Sure Grip Steel Tackle Blocks.....25%

Washing—

Anthony Wayne, ₩ doz No. 1, $51 No. 2, $45; No. 3, $42.
Western Star ₩ do

Mallets.
Hickory ..... 20&10@20&10&10%
Lignumvitæ ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. ..... 30@30&10%

Mattocks. Regular list. ..... 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₩ dozen, $4: ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Menders, Harness—
Per doz. $2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888 ..... 60&2%
American, Enterprise Mfg Co. 20&10@30%
The Swift, Lane Bros. ..... 20&10%

Mincing Knives — See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers — See Drawers, Money.

Mowers, Lawn.
Pennsylvania, New Model, Excelsior, Continental, &c. ..... 60@60&5%
Philadelphia ..... 60&10%
Perfection ..... 60&10&10%
Easy ..... 60&10@60&10&5%
Bay State ..... 60&10@60&10&.%
Other Machines ..... 60&10&5@70%

Muzzles—
Safety ..... ₩ doz. $3.00, 25%

Nails,
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89. 75&10@80%
Tack Mfrs.' list ..... 70@70&10%
Wire Nails, Standard Penny.
Card June 1 '89 base ..... $2.10 @ $2.20

Horse—

	Nos. 6	7	8	9	10
Ausable	.28¢	26¢	25¢	24¢	23¢.
	40&5&5&2%				
Clinton, Fin.	.19¢	17¢	16¢	15¢	14¢ 30%
Essex	.28¢	26¢	25¢	24¢	23¢.
	40&5&5&2%				
Lyra	.19¢	17¢	16¢	15¢	14¢ 30%
Snowden	.19¢	17¢	16¢	15¢	14¢ 30%
Putnam	.23¢	21¢	20¢	19¢	18¢.
	1000 ℔ in year 15%				
Vulcan	.23¢	21¢	20¢	19¢	18¢..12½&2½%
Northwest'n	.25¢	23¢	22¢	21¢	20¢.
	25@25&2%				
Globe	.23¢	21¢	20¢	19¢	18¢.
	20&5&5%				
Boston	.23¢	21¢	20¢	19¢	18¢.
	20&5&5%				
A. C.	.25¢	23¢	22¢	21¢	21¢.
	25&10@33½&5%				
C. B.-K.	.25¢	23¢	22¢	21¢	21¢.
	25&10@33½&5%				
Maud S	.25¢	23¢	22¢	21¢	21¢.
	40&10%				
Champlain	.23¢	20¢	25¢	24¢	23¢.
	25&10&10%				
Saranac	.23¢	21¢	20¢	19¢	18¢...30&10%
Champion	.25¢	23¢	22¢	21¢	20¢.
	10&10&10%				
Capewell	.23¢	20¢	5¢	24¢	23¢.
	35&5@35&10%				
Star	.23¢	21¢	⅝¢	19¢	18¢.
	10&10@10&12½%				
Anchor	.23¢	21¢	20¢	19¢	18¢ 35%
Western	.23¢	21¢	20¢	19¢	18¢...40&10%
Empire Bronzed	..... 14 ₩ ℔.				

Picture—
Brass Head, Sargent's list ..... 50&10&10%
Brass Head, Combination list ..... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent 40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.40¢	6.00¢ off list.
Cold Punched	5.00¢	5.10¢ off list.

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—
Best or Government ..... ₩ ℔ 7@7¼¢
U. S. Navy ..... ₩ ℔ 6@6½¢
Navy ..... ₩ ℔ 5½@6¢

Oilers—
Zinc and Tin ..... 65&10@70%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10&10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass 50%
Olmstead's Tin and Zinc 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc 60%
Broughton's Brass 50%
Gem P. D. & Co. ..... ₩ gro. $2
Steel, Draper and Williams 60%

Openers, Can.
Messenger's Comet ..... ₩ doz $3.00, 25%
American ..... ₩ gross $3.00
Duplex ..... doz 25¢, 15@20%
Lyman's ..... ₩ doz $3.75, 20%
No. 4 French ..... ₩ doz $2.25, 55@60%
No. 5, Iron Handle ..... ₩ gr $6.00, 45@50%
Eureka ..... ₩ doz $2.50, 10%
Sardine Scissors ..... ₩ doz $2.75@3.00
Star ..... ₩ doz $2.75
Sprague, No. 1, $3.00 2, $2.25; 3, $2.50. 50&10&10%
Excelsior No. 1 $2.50: No. 2, $1.50 ..... 40%
World's Best, ₩ gross, No. 1, $12.00. No. 2, $24.00; No. 3, $36.00 ..... 50&10%
Universal, ₩ doz $3.00 ..... 25&5%
Domestic, ₩ doz $2.50 ..... 45%
Champion ₩ doz $2.00 ..... 50%

Packing, Steam—
Rubber—
Standard ..... 60&5@65%
Extra ..... 50@50&5%
N. Y. B. & P. Co., Standard 50%
N. Y. B. & P. Co., Empire 60%
N. Y. B. & P. Co., Salamander 25%
Jenkins' Standard, ₩ ℔ 80¢ ..... 25@25&5%
Miscellaneous—
American Packing ..... 10¢@11¢ ₩ ℔
Russia Packing ..... 14¢ ₩ ℔
Italian Packing ..... 13¢@14¢ ₩ ℔
Cotton Packing ..... 15¢@17¢ ₩ ℔
Jute ..... 7¢@8¢ ₩ ℔

Padlocks—See Locks.

Pails.
Galvanized Iron—

	Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75	
Helwig's	2.50	2.75	3.00	
Sidney Shepard & Co.	2.35	2.85	3.05	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt ..... ₩ doz $5.40
Stable and Milk, 14 qt ..... ₩ doz $6.00
Fire Pails, deep ..... ₩ doz $5.40
" " round bottom ..... ₩ doz $7.80
Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.
Dripping.
Small sizes ..... ₩ ℔ 6½¢
Large sizes ..... ₩ ℔ 5½¢
Silver & Co. (Covered) 40%
Fry—
Standard List:

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.		5	6	7	8
₩ doz.		$6.00	$7.00	$8.00	$9.00

Polished, regular goods ..... 75@75&10%
Acme Fry Pans ..... 60&10%
Dust—
Steel Edge, No. 1 ..... ₩ doz $1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886 ..... 50@50&10%
Sibley's Emery and Crocus Cloth 30%

Parers.
Apple.
Advance ..... ₩ doz $4.75
Baldwin ..... ₩ doz 5.25
Bonansa ..... each 5.00
Daisy ..... ₩ doz 4.00
Dandy ..... each 7.50
Eclipse ..... ₩ doz 4.25
Eureka, 1888 ..... each 10.00
Family Bay State ..... ₩ doz 12.00
Favorite ..... ₩ doz 5.00
Gold Medal ..... ₩ doz 4.00
Ideal ..... ₩ doz 4.00
Improved Bay State ..... ₩ doz 27.00 @ 30.00
Little Star ..... ₩ doz 4.50
Monarch ..... ₩ doz 13.50
New Lightning ..... ₩ doz 5.50
Oriole ..... ₩ doz 4.00
Penn ..... ₩ doz 4.00
Perfection ..... ₩ doz 4.00
Pomona ..... ₩ doz 4.00
Rocking Table ..... ₩ doz 6.00
Turn Table ..... ₩ doz 4.50
Victor ..... ₩ doz 13.50
Waverly ..... ₩ doz 4.00
White Mountain ..... ₩ doz 4.00
72 ..... ₩ doz 4.25
78 ..... ₩ doz. 7.00
Potato—
White Mountain ..... ₩ doz $4.50
Antrim Combination ..... ₩ doz $5.50
Hoosier ..... ₩ doz $13.50
Saratoga ..... ₩ doz $5.50

Pencils—
Faber's Carpenters' ..... high list 50%
Faber's Round Gilt ..... ₩ gro $5.25
Dixon's Lead ..... ₩ gro $4.50
Dixon's Lumber ..... ₩ gro $6.75
Dixon's Carpenters' 10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 ..... 60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Box—
Humason, Beckley & Co.'s ..... 60&10%
Sargent & Co's ..... $17 and $18 ..... 60&10%
Peck, Stow & W Co ..... 50&10@50&10&5%
Curtain—
Silvered Glass ..... net
White Enamel ..... net
Escutcheon,
Iron, list Nov. 11, 1885 ..... 50&10@50&10&5%
Brass ..... 60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 57½%
1¼ and under, Galvanized 47½%
1½ and over, Plain 67½%
1½ and over, Galvanized 55%
Boiler Tubes,
Sizes up to 2¾ in. inclusive 55%
Sizes 3 to 6 in. inclusive 65%
Sizes 7 in. and up 65%
Casing 55%
Steel Boiler Tubes 30%

Planes and Plane Irons—
Wood Planes—
Molding ..... 40&10%
Bench, First Quality ..... 50&10%
Bench, Second Quality ..... 55&10%
Bailey's (Stanley R. & L. Co.). .. 40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.). ..... 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.). ..... 20&10@20&10&10%
Steer's Iron Planes ..... 35@35&10%
Merrien Mal. Iron Co.'s ..... 40@40&10%
Davis's Iron Planes ..... 40@40&10%
Birmingham Plane Co. ..... 50@50&10%
Gage Tool Co.'s Self-Setting ..... 20&10&10%
Chaplin's Iron Planes ..... 40@40&10%
Sargent's ..... 30&10@30&10&10%
Standard Tool Co. ..... 50@50&5%
Plane Irons—
Butcher's ..... $5.00@$5.25 to 2
Buck Bros 30%
Auburn "Thistle" ..... } 30&10%
Ohio ..... }
Sandusky ..... }
S. & I. J. White 25%

Plates.
Felloe ..... ₩ ℔ 5¢@5½¢

Pliers and Nippers—
Button's Patent ..... 50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₩ doz ..... 20&10@33½%
Humason & Beckley Mfg. Co. 50@50&10%
Lindsay's Giant 40%
Gas Pliers 60%
Gas Pliers, Custar's Nickel Plated. 60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters 20%
Morrill's Parallel, ₩ doz, $12.00 ..... 30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40&10&5%

Plumbs and Levels—
Regular List ..... 70&10@70&10&10%
Disston's 50%
Pocket Levels ..... 70&10@70&10&10%
Davis Iron Levels 30%
Davis' Inclinometers ..... 10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00 ..... 25%
Silver & Co., 6-Ring, ₩ doz $4; 3-Ring $2

Pokes, Animal—
Bishop's I. X. L. ..... ₩ doz $6.00
Bishop's O. K. ..... ₩ doz $5.25
Bishop's Pioneer ..... ₩ doz $3.75
Bishop's American ..... ₩ doz $2.75
Eagle, Double Stale ..... ₩ doz $5.75
Eagle, Single Stale ..... ₩ doz $3.75
Buckeye, Single Stale ..... ₩ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $35.00 ₩ doz 10%
Tower's 25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₩ doz $48.00; Nickeled, $57.00: 3 Hands, Polished, ₩ doz $72.00; Nickeled, $84.00 ..... 25%
J. P. Lovell's Police Goods 25%

Polish, Metal.
Prestoline 30%
Prestoline Paste 33⅓%
Gaston's Silver Compound 33⅓%

Polish, Stove.
Joseph Dixon's ..... ₩ gro $6.00, 10%
Gem ..... ₩ gro $4.50, 10%
Gold Medal ..... ₩ gro $6.00, 25%
Mirror ..... ₩ pro $6.00, —%
Lustro ..... ₩ gro $4.75
Ruby ..... ₩ gro $3.75
Rising Sun, 5 gro lots ..... ₩ gro $5.50
Dixon's Plumbago ..... ₩ ℔ 8¢
Boynton's Noon Day, ₩ gro 13.00
Parlor Pride Stove Enamel .. ₩ gro
Yates' Liquid, 2 3 5 10 gal....
₩ gal ...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₩ ℔ 12½¢
Jet Black ..... ₩ gro $3.50
Japanese ..... ₩ gro $3.50
Fireside ..... ₩ gro $2.50
Diamond O. K. Enamel ..... ₩ gro $19.00
Bonnell's Liquid Stove Polish ₩ gro $9.00
Bonnell's Paste Stove Polish .. ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans ..... 12½¢
Black Jack Water Paste, 5 and 10 ℔ cans ..... 12½¢
Nickel Plate Paste ..... ₩ gro $6.00
Crown Paste ..... ₩ gross, $7.20
Crown Paste, in 5 and 10 ℔ pails ₩ ℔ 12¢
Black Flag ..... ₩ gross, $7.20
Black Flag, 5 and 10 ℔ pails .... ₩ ℔ 12¢
Black Flag, liquid, in bottles, ₩ gro. $8.00

Peppers, Corn—
Round or Square, 1 qt. ₩ gr $10.00@10.50
Round or Square, 1½ qt. ₩ gr $15@15.50
Round or Square, 2 qt. ₩ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned ..... 40&10@40&10&5%
Enameled ..... 40&10@40&10&5%
Family, Hower's "Eureka" 40%
Family, L. F. C.'s "Handy" 50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20&10&30%
Henis ..... ₩ doz $3.50
Shepard's Queen City 40%
Silver & Co. ..... ₩ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton ..... ₩ doz $13.00, 23½%
Curtiss Hammer ..... ₩ doz $9.00
Giant, No. 1 ..... ₩ doz. $13.00, 10%
Giant, No. 2 ..... ₩ doz, $15.00, 10%
Pelican ..... ₩ doz, $9.00, 25%
Eclipse ..... each, $2.00 net

Pulleys—
Hot House, Awning, &c. ..... 60&10%
Japanned Screw ..... 60&10%
Brass Screw ..... 60&10%
Japanned Side ..... 60%&10%
Japanned Clothes Line ..... 60&10%
Empire Sash Pulley ..... 55@60%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00: Swivel, $4.50 ..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "P" Common and Pat. Bushed 20%
Hay Fork, Tartox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Shade Rack 45%
Tackle Blocks ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₩ doz $12.00 ..... 40%

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ..... 67½@70%
Pitcher Spout, Cheaper G'ds .. 75@75&10%

Punches—
Saddlers' or Drive, good, ₩ doz ..... 60@65%
Bemis & Call Co.'s Cast Steel Drive. 50&5%
Bemis & Call Co's Springfield Socket. 50&5%
Spring, good quality ..... ₩ doz $2.50@2.60
Spring, Leach's Pat. 15%
Bemis & Call Co.'s Spring and Check .. 40%
Solid Tinners', P. S. & W. Co., ₩ doz $1.44, 55%
Tin'rs' Hollow Punches P. S. & W. Co. 20&2%
Rice Hand ..... inches 15%
Avery's Revolving 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₩ ℔ 35¢ 15%
Sliding Door, Bronzed Wr't Iron .. ₩ ft. 7¢
Sliding Door, Iron, Painted, ₩ foot 4¢, 40%
Barn Door, Light, in. ½ ⅝ ¾
Per 100 feet $2.00 2.50 3.10, 10%

B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.35 net
Terry's Steel Rail, ₩ foot			4½¢
Victor Track Rail, 7¢ ₩ foot			50&5%
Carrier Steel Rail, ₩ foot			4½¢
Moore's Wrought Iron			35%

Rakes—
Cast Steel, Association goods ..... 66⅔@70%
Cast Steel, outside goods 60&10@70&5%
Malleable ..... 70@70&5%
Gibbs Lawn Rake ..... $12.00, 50&15%
Canton Lawn Rake ..... $9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless 35%
Fort Madison Steel Tooth Lawn Rake, $6.00 ..... 25%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to £. 10%
Jordan's AAAI, new list ..... net
Jordan's Old Faithful, new list ..... net
Galvanic ..... ₩ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co. 55%
Sargent's ..... 66⅔&10@70&5%
Hotchkiss' low list 30%
Humason, Beckley & Co.'s ..... 70&10%
Peck, Stow & W. Co's ..... 50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%
Hog—
Top of the Hill Ringers ..... ₩ doz $2.00
Top of the Hill Rings ..... ₩ doz $1.25
Hill's Improved Ringers ..... ₩ doz $1.25
Hill's Old Style Ringers ..... ₩ doz $1.12½
Hill's Tongs ..... ₩ doz $3.00
Hill's Rings ..... ₩ doz bxs $1.00
Perfect Rings ..... ₩ doz bxs $1.50
Perfect Ringers ..... ₩ doz $2.15@$2.25
Blair's Hog Ringers ..... ₩ doz $2.00
Blair's Hog Rings ..... ₩ doz 90¢@$1.00
Champion Ringers ..... ₩ doz $2.00
Champion Rings, Double ..... ₩ doz $2.25
Brown's Ringers ..... ₩ doz $2.00
Brown's Rings ..... ₩ doz $1.15@1.25
Electric Hog Rings ..... ₩ doz boxes $1.50
Electric Hog Ringers ..... ₩ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87 ..... 40%
Copper ..... 60@60&10%
Coppered Iron, Bettina Brand 40%

Rivet Sets—See Sets.

Rods—
Stair, Brass ..... 25&2%
Stair, Black Walnut ..... ₩ doz 40¢

Rollers—
Barn Door, Sargent's list ..... 60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%

Rope.
Manila, ¼ in. and larger ..... ₩ ℔ 10½¢
Manila ..... ⅜ in. ₩ ℔ 10¾¢
Manila ..... ½ and 5-16 in. ₩ ℔ 11½¢
Manila Tarred Rope ..... ₩ ℔ 9¾¢
Manila, Hay Rope ..... ₩ ℔ 10½¢
Sisal ..... ⅜ inch and larger ₩ ℔ 6¾¢
Sisal ..... ⅜ in. ₩ ℔ 7½¢
Sisal ..... ¼ and 5-16 in. ₩ ℔ 7¾¢
Sisal, Hay Rope ..... ₩ ℔ 6¾¢
Sisal, Tarred Rope ..... ₩ ℔ 6½¢
Sisal, Medium Lathe Yarn ..... ₩ ℔ 5½¢
New Zealand, ⅜ in. and larger ₩ ℔ 6½¢
New Zealand ..... ⅜ inch, ₩ ℔ 6¾¢
New Zealand, ¼ and 5-16 inch, ₩ ℔ 7½¢
New Zealand, Hay Rope ..... ₩ ℔ 6¾¢
New Zealand, Tarred Rope ..... ₩ ℔ 5¾¢
Note.—Manufacturers' prices on above ½¢ ₩ ℔ less, f. o. b. factory.
Cotton Rope ..... ₩ ℔ 13½@16¢
Jute Rope ..... ₩ ℔ 6 @6½¢
Wire—
List May 1, 1886.
Iron ..... 33½&2½%
Iron, Galvanized ..... 40&2½%
Cast Steel ..... 40&2½%

Rules—
Boxwood ..... 30&10&10@30&10&10&10%
Ivory ..... 50@50&10%
Starrett's Rules and Straight Edges, Steel ..... 25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
Disston's Circular 45%
Disston's Cross Cuts 45%
Disston's Hand 30%
Woodrough & McParlin.
Hand, Panel and Rip 25%
Narrow Champion Cross Cuts with Handles, ₩ foot ..... 20¢
Champion Thin Back Cross Cuts, ₩ foot ..... 28¢
Champion Extra Thin Back Cross Cuts, ₩ foot ..... 31¢
One Man Champion Cross Cuts, ₩ foot ..... 40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip 30%
Narrow Champion Cross Cuts with Handles, ₩ foot ..... 20¢
Champion Thin Back Cross Cuts, ₩ foot ..... 28¢
Champion Extra Thin Back Cross Cuts, ₩ foot ..... 31¢
One Man Champion Cross Cuts. ₩ ft. 40¢
Atkins' Circular Shingle and Heading dis 50%
Atkins' Silver Steel Diamond X Cuts ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ₩ foot 32¢
Atkins' Champion and Electric Tooth X Cuts ..... ₩ foot 30¢
Atkins' Hollow Back X Cuts. ₩ foot 20¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles. ₩ foot 40¢
Peace Circular and Mill 45%
Peace Hand Panel and Rip 25%
Peace Cross Cuts 45%
Richardson's Circular and Mill 45%
Richardson's X Cuts 45%
Richardson's Hand, &c 25%
C. E. Jennings & Co., Hand, Panel and Rip 25

Hack Saws—
Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—
Hatch, Counter, No. 171, good quality, ₩ dos $21.00
Hatch, Tea, No. 161....₩ dos $6.75@7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10%
Richie Bros.' Platform.....40%

Scale Beams—See Beams, Scale.

Scissors, Fluting.....45%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₩ dos $4.00. 10%
Box, 2 Handle.....₩ dos $6.00. 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common.....₩ dos $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.
Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₩ dos $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Hand, Grand Rapids, list.....55%
Lag, Blunt Point, list Jan. 1, 1890..75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....75@75&10%
Bed.....25&5%
Hand Rail, Sargent's.....60&10%
Hand Rail, H. & F. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent..60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Cork—
Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%

Wood—
List January 1, 1891.
Flat Head Iron.....72½% } Extra 10 & 10&5 % off given.
Round Head Iron.....67½%
Flat Head Brass.....72½%
Round Head Brass.....65 %
Flat Head Bronse.....72½%
Round Head Bronse.....65 %
Rogers' Drive Screws.....83⅓%

Scroll Saws—See Saws, Scroll.

Scythes.
Grain.....40&5@40&10%
Grass.....40&10@50%

Scythe Snaths—See Snaths, Scythe

Sets.
Awl and Tool.
Aiken's Sets, Awls and Tools, No. 20, ₩ dos $10.00.....55&10%
Pray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $13; 4, $9.....55@55&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12, 2, $18.....25%
Henry's Combination Hart...₩ dos $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....50&10%

Nail—
Square.....₩ gr., $4 00@$4.25
Round.....₩ gr. $3.25
Buck Bros.....37½%
Cannon's Diamond Point...₩ gr., $12, 20%

Rivet,
Regular list.....50&10%

Saw—
Stillman's Genuine...₩ dos $5.00@7.75. 40&5%
Stillman's Imita.....₩ dos $3.25@5.25. 40&5@40&10%
Common Lever.....₩ dos $2.00. 40&5%
Morrill's No. 1, $15.00; Nos. 2&4, $24.00. 40&10@50%
Leach's. No. 0, $8.00; No. 1, $15, 15@20%
Nash's.....20&10@20&10&10
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$12.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat, Lever.....30%
Diston's Star.....25%
Leopold.....40&10@50%
Atkin's Lever.....₩ dos No. 1, $6.00
Atkin's Criterion.....₩ dos No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Chieftain Co.'s Superior.....₩ dos $7.00
Chieftain Co.'s Royal.....₩ dos $7.50
Crescent.....₩ dos $3.00

Sharpeners, Knife.
Parkins.
Applewood Handles....₩ dos $6.00, 40%
Rosewood or Cocobolo. ₩ dos $900 40%

Shaves, Spoke
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's, ₩ dos $9.00.....25%

Shears—
American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₩ dos $3.75
Tinners'.....20&5%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
Cast Steel Trimmers: First quality.....80@80&10% Second quality.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Davenport Cutlery Co.....60@60&10%
Clauss Shear Co., Japanned...70%
Clauss Shear Co., Nickeled, same list. 60%
Galvanic, 3½ to 9 in, ₩ doz, $1.00 ₩ inch

Pruning Shears and Hooks.
Diston's Combined Pruning Hook and Saw.....₩ dos $18.00, 20&10%
Diston's Pruning Hook, ₩ dos $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₩ dos $3.75@4.00
Henry's Pruning Shears, ₩ dos $4.25@4.50
Wheeler, M. & C. Co.'s Combination, ₩ dos $12.00, 20%
Dunlap's Saw and Chisel, ₩ dos $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co.....60%

Tinners', &c.—
Shears and Snips (P. S. & W.).....20@25%
Snips, J. Mallinson & Co.....33⅓%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%

Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Shells—
First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prise.....40&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%

Shells Loaded—
Standard List, July 19, 1890..40&10&10%

Ship Tools—
L. & I. J. White.....20&5%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phoenix and Bryden's Boss, at factory.....$4.00
Bryden's Frog Pressure, at factory.$5.00

Mule—
Add $1 ₩ keg to above prices.

Ox, Wrought—
Ton lots.....₩ ₺ 9¢
1000 ₺ lots.....₩ ₺ 9½¢
500 ₺ lots.....₩ ₺ 10¢

Shot—

	Ton lots	Small lots
Drop, up to B, 25-₺ bag	$1.42	$1.47
Drop, uo to B, 5-₺ bag	.35	.36
Drop, B and larger, 25-₩ bag	1.67	1.72
Drop, B and larger 5-₺ bag	.40	.41
Buck and Chilled, 25-₺ bag	1.67	1.72
Buck and Chilled, 5-₺ bag	.40	.41
Dust Shot, 25-₺ bag	2.00	2.05
Dust Shot, 5-₺ bag	.45	.46

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5&7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
H. M. Myers Co.....30%
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)90&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Sieves—

	Iron.	Plated.
Mann's Tin Rim.....50&25%		
Buffalo Metallic, S. S. & Co.....50&25%		
Shaker (Barler's Pat.) Flour Sifters, ₩ dos $2.00; ₩ gr $21.60		
Electric.....₩ gr $21.00		
A. & W. Sifters.....₩ dos 2.00		
Hunter's.....₩ dos $2.00		
Smith's Adjustable Sifters ...₩ dos $2.00		
Smith's Adjustable Milk Strainer, ₩ dos $2.00		
Smith's Adjustable T. & C. Strainer, ₩ dos. $1.25		
Sieves, Wooden Rim—		
Mesh 18, Nested, ₩ dos..	80¢	$1.00
Mesh 20, Nested, ₩ dos..	95¢	1.10
Mesh 24, Nested, ₩ dos..	$1.15	1.35

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel...Special net prices
Coldbrookdale Iron Co.....60%
Seneca Falls Pattern.....60%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Slates—
School, by case.....50&10@50&10&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fiton's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&2%
Covered Spring.....60&10&10%

Snaths, Scythe.
List.....50%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.
Standard Fiberware—
Cuspidors, 8½-inch, ₩ dos., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bro.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co...40, 15&5%
L. Boardman & Son.....50&12½%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal.....50, 10&5%
18% Rogers' German Silver.....60&5%
22% Rogers' Nickel Silver.....50&5%
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60@60&5%
Boardman's N'ck'l Silver, list July 1, 1891.....60½&5 % cash
Boardman's Britannia Spoons, case lots.....60&5% cash

Springs—
Door.—
Torrey's Rod, regular size....₩ dos $1.80
Gray's, ₩ gr., $20.00.....20%
Bee Rod ₩ gr., $20.00.....20%
Warner's No. 1, ₩ dos, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's....No. 1, ₩ dos, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₩ dos, $4.50....55&10%
Hercules.....50%
Shaw Door Check and Spring.25@50@50%

Carriage, Wagon, &c.—
Elliptic, Concord, Platform and Half Scroll.....60&10&10%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....} .80&10@80&10&10%
Nickel-Plated.....}
Try Square and T Bevels...60&10@60&10&10%
Diston's Try Square and T Bevels.....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Squeezers.
Fodder.—
Blair's.....₩ dos $2.00
Blair's "Climax".....₩ dos $3.25
Lemon—
Porcelain Lined, No. 1....₩ dos $6.00, 25&20%
Wood, No. 2.....₩ dos $3.00, 35%
Wood, Common.....₩ dos $1.70@1.75
Dunlap's Improved.....₩ dos $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ dos.....25&10%
Jennings' Star.....₩ dos $2.50
The Boss.....₩ dos $2.50
Dean's..Nos. 1, ₩ dos $6.50; 2, $8.35; 3, $1.90; Queen, $2.50
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₩ dos $12.00
Silver & Co.. Glass.....₩ gro, $9.00
Manny Lemon Juice Extractor: Standard.....₩ doz $0.75@$1.00 Improved.....₩ doz $3.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.
Blind—
Barbed, ½ in. and larger.....₩ ₺ 7@7½¢
Barbed, ⅝ in.....₩ ₺ 8@8½¢
Fence Staples, Galvanized. } Same price as B'rb Wire
Fence Staples, Plain..... } See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....40&10&10%
Butterfield's Goods.....40@40&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....35&5&5@40%
Reversible Ratchet.....30 %
Gardner.....35%

Stops, Bench.
Morrill's.....₩ dos $9, 50%
Hotchkiss's.....₩ dos $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....₩ dos $3.....10%
Cincinnati.....35&10%

Stone—
Hindostan No. 1, 3¢; Axe, 3¾¢; Slips No. 1, 4½¢
Sand Stone.....₩ ₺ 2½¢
Washita Stone, Extra.....₩ ₺ 22@23¢
Washita Stone, No. 1.....₩ ₺ 19@20¢
Washita Stone, No. 2.....₩ ₺ 12@13¢
Washita Slips, No. 1, Extra..₩ ₺ 44@46¢
Washita Slips, No. 1.....₩ ₺ 33@35¢
Arkansas Stone, No. 1, 4 to 6 in₩ ₺ $1.50
Arkansas Stone, No. 1, 6 to 9 in₩ ₺ $1.35
Turkey Oil Stone, 4 to 8 in.....₩ ₺ 40¢
Turkey Slips.....₩ ₺ $1.00@1.50
Lake Superior, Chase.....₩ ₺ 12¢
Lake Superior Slips, Chase.....₩ ₺ 20¢
Seneca Stone, Red Paper Brand....₩ ₺ 18@20¢
Seneca Stone, High Rounds..₩ ₺ 20@25¢
Seneca Stone, Small Wheels..₩ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.
Cast Steel, Polished.....₩ dos $2.25
Cast Iron, Steel Points.....₩ dos 80¢
Socket.....₩ dos $1.75
Gullard's.....25@25&10%

Strops, Razor—
Genuine Emerson.....60@60&5%
Imitation " ....₩ dos $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₩ dos $2.00
Lamont Combination.....₩ dos $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%
Electric.....List net

Stuffers or Fillers, Sausage—
Miles' "Challenge," ₩ dos $20, 50@50&5%
Perry.....₩ dos, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....30%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Sweepers, Carpet.
Bissell No. 5.....₩ dos $17.00
Bissell No. 7 New Drop Pan.₩ dos $19.00
Bissell, Grand.....₩ dos $36.00
Grand Rapids.....₩ dos $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₩ dos $15.00
Jewel.....₩ dos $17.00
Improved Parlor Queen, Nickeled.....₩ dos $37.00
Japanned.....₩ dos $24.00
Excelsior.....₩ dos $22.00
Garland.....₩ dos $18.00
Parlor Queen.....₩ dos $24.00
Housewife's Delight.....₩ dos $15.00
Queen.....₩ dos $16.00
Queen, with band.....₩ dos $18.00
King.....₩ dos $30.00
Weed, Improved.....₩ dos $18.00
Hub.....₩ dos $16.00
Cog-Wheel.....₩ dos $16.00
Easy.....₩ dos $22.00
Monarch.....₩ dos $22.00
Goshen.....₩ dos $21.00
Ladies' Friend.....₩ dos $15.00
Advance.....₩ dos $18.00
Supreme.....₩ dos $22.00

Tacks, Brads, &c.—

List October 19, 1889. Old established standard weights. Short weight goods are sold at lower prices.

Carpet Tacks—
American, Blued.....75 %
American, Tin'd and Cop'd.77½ %
Steel, Bright and Blued...72½ %
Steel, Tinned and Coppered 75 %
Swedes Iron, Blued.....72½ %
Swedes Iron, Tinned.....75 %
American Iron Tacks.....72½ %
Swedes Iron Tacks—
S. S., Blued.....75 %
S. S., Tinned.....77½ %
Lanc., Blued.....66⅔ %
Lanc., Tinned.....72½ %
Gimp and Lace Tacks—
S. S., Blued.....75 %
S. S., Tinned.....77½ %
Lanc., Blued.....66⅔ %
Lanc., Tinned.....72½ %
Basket and Trimmers' Tacks—
Lanc.....65 %
S. S.....70 %
Hungarian Nails.....66⅔ %
Miners' Tacks, S. S.....75 %
Miners' Tacks, Lanc.....70 %
Common and Patent Brads..66⅔ %
Leathered Tacks.....60 %
Brush Tacks.....50 %
Looking Glass Tacks.....50 %
Picture-Frame Points.....50 %
Finishing Nails.....66⅔ %
Trunk and Clout Nails—
Black.....66⅔ %
Tinned or Coppered.....66⅔ %
Basket Nails.....63⅓ %
Chair Nails.....62½ %
Cigar-Box Nails.....50 %
Tin Capped Nails.....50 %

On many of these goods extra 10@10&10 % is often given. Regular discount 10&2 %, cash.

Miscellaneous—
Double-Pointed, 120 count.....85&10%
Wire Carpet Nails.....50&10%
Plymouth Rock Steel Carpet Tacks..25%
Wire Brads and Nails, see Nails, Wire.
Steel-Wire Brads, B. & E. Mfg. Co.'s list.....50&10%

Tapes, Measuring—
American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....35@30%

Thermometers—
In Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears Tinners', &c.

Tinware—
Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.
Coopers'—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%
Lumber.
Ring Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies....₩ doz $19.00
Cant Hooks, "Blue Line".₩ doz $16.00
Cant Hooks, Common Finish..₩doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft. $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz. 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz. 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz. 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $18.00
Saw.
Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood,Choker, ₩ doz holes,11@12¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50 15%
Mouse, Bonanza.....₩doz $0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $13.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—
Butter and cheese.....25%

Trimmers, Spoke.
Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—
Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '92.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	R.
No. 9, ¼ and ⅛ ℔ Balls	25¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	28¢
No. 264, Mattrass, ¼ and ⅛ ℔ Balls	59@64¢	
Chalk Line, Cotton, ⅛ ℔ Balls	25¢	
Mason Line, Linen, ⅛ ℔ Balls	55¢	
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)	15¼¢	
2-Ply Hemp, 1 ℔ Balls	16¢@16¼¢	
3-Ply Hemp, 1¼ ℔ Balls	15¢@15¼¢	
Cotton Wrapping, 5 Balls to ℔	15¢@18¢	
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls	10¢	
Wool	6¼¢@6¾¢	
Paper	13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.	18¢	

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40@5@40&10%
Merrill's.....15@20%
Sargent's.....60@10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20@25%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60%&10%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Miscellaneous.
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢
U.M.C.&W. R. A.—B. E., 9&10...	82¢
U.M.C.&W. R. A.—B. E., 8.....	96¢
U.M.C.&W.R.A.—B. E., 7.....	$1.10
U.M.C.&W. R. A.—P. E., 11 up..	1.15
U.M.C.&W. R. A.—P. E., 9&10..	1.50
U.M.C.&W. R. A.—P. E., 8.....	1.70
U.M.C.&W.R.A.—P. E., 7.....	1.80
Eley's B. E., 11 up.....	$1.70@$1.75
Eley's P. E., 11@20.....	3.00@ 3.25

Dis. 30&5

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....70&10@70&10&5%
Boilers and Saucepans.....50&10@60%
Tinned Boilers and S'pans.....50&10@60%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Kettles—
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢		75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11½ in.....		4.00
Cuspidors.....		3.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.
Indurated Fiber—25%
Spittoons, No. 2, ₩ doz.....$3.40
Basins, Ringed, ₩ doz., No. 2.....$3.00
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.90
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.70
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....$1.00
See also Pails.
Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.

Reed & Barton.....	40&5%
Meriden Britannia Co.....	
Simpson, Hall, Miller & Co.....	
Rogers & Brother.....	
Hartford Silver Plate Co.....	40&5&5%
William Rogers Mfg. Co.....	

Washers—

Size hole.....	5-16	⅜	½	⅝ to 1¾
Washers.....	6	5	3.50	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—
Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.
8 in., $2.35; 10 in., $2.70; 12 in., $3.25

Wire and Wire Goods—
Iron—
Market,
Br. & Ann., Nos. 0 to 18.....77½&5
Cop'd, Nos. 0 to 18.....75&5
Galv., Nos. 6 to 18.....67½&5
Tin'd, Tinned list Nos. 0 to 18....67½&5
Stone,
Br. and Ann'd, Nos. 16 to 18....77½&5
Bright and Ann'd, Nos. 19 to 26.....80%
Br. and Ann'd, Nos. 27 to 36.....82½&5
Tinned.....
Tinned Broom Wire, 18 to 21, ₩ ℔.....5¢
Galvanized Fence, Nos. 8 and 9.....70%
Brass, list Jan. 18, 1884.....35%
Copper, list Jan. 18, 1884.....35%
Annealed Wire on Spools.....55%
Malin's Steel and Tin'd on Spools.....55%
Malin's Brass and Cop. on Spools.....45%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Cop. and Brass.....45%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $.30%
Steel Music Wire, 12 to 30...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.
Bright Wire Goods—
Standard list.....80&10%
Wire Cloth and Netting.
Painted Screen Cloth, good quality ₩ 100 sq. ft., $1.40
Galvanized Wire Netting.....70&10@75%

Wire, Barb.—F.o.b. Cars. Dis. 3% cash in 10 days.

	Painted.	Galvanized.
Pittsburgh and Cleveland.	$2.55	$3.05
Allentown, Cincinnati and Joliet.....	2.65	3.15
St. Louis.....	2.70	3.20
Keokuk.....	2.75	3.25
Lockport, Baker Perfect..	2.85	3.35
Lawrence and Omaha....	2.90	3.40
San Francisco.....	3.80	4.30

Wire Rope—See Rope, Wire.

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&5%
Coes' "Mechanics".....60&10&5%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'.. 60&10%
Lamson & Sessions' Standard.... 70&10%
P. S. & W. Agricultural.... 75&10@75
Girard Agricultural..... 10&5%
Lamson & Sessions' Agric'l..
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....35%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....35%
Boardman's.....30&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....30&10%
Acme, Bright.....50&5%
Acme, Nickeled.....40&5%
Hercules.....70%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....35&10%
Tafts' Vise Wrench.....55&10&5%

Wringers, Clothes—
Am. Wringer Co.'s list, July 15, '91, 2% cash
Colby Wringer Co., list Sept. 1, '91, 2% cash

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1888, 35@35&10%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	37	@	..
Linseed, City, boiled.....	40	@	..
Linseed, Western, raw.....	35	@	38
Lard, City, Extra Winter..	57	@	..
Lard, City, Prime.....	54	@	55
Lard, City, Extra No. 1....	42½	@	45
Lard, City, No. 1.....	37½	@	40
Lard, Western, prime.....	53	@	54
Cotton-seed, Crude, prime..	..	@	30
Cotton-seed, Crude, off grades.....	25	@	28
Cotton-seed, Summer Yellow, prime.....	34	@	35
Cottonseed, Summer Yellow, off grades.....	31	@	33
Sperm, Crude.....	68	@	70
Sperm, Natural Spring.....	..	@	..
Sperm, Bleached Spring....	..	@	..
Sperm, Natural Winter....	73	@	75
Sperm, Bleached Winter...	78	@	80
Whale, Crude.....	..	@	45
Whale, Natural Winter.....	54	@	56
Whale, Bleached Winter....	56	@	58
Whale, Extra Bleached....	58	@	60
Sea Elephant, Bleached Winter.....	63	@	64
Menhaden, Crude, Sound..	..	@	30
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	..	@	32
Menhaden, Bleached W'ter.	33	@	34
Menhaden, Extra Bleached	35	@	36
Tallow, City, prime.....	..	@	43
Tallow, Western, prime....	..	@	..
Cocoanut, Ceylon.....	6	@	6¼
Cocoanut, Cochin.....	7	@	7¼
Cod, Domestic	34	@	36
Cod, Foreign.....	..	@	..
Red Elaine	32	@	33
Red Saponified..... ₩ ℔	5	@	5¼
Sank.....per gal	32	@	33
Straits.....	33	@	34
Olive, Italian, bbls.....	62	@	65
Neatsfoot, prime.....	55	@	65
Palm, prime, Lagos....₩ ℔	6	@	6¼

Mineral Oils.

Black, 20 gravity, 25 @ 30 cold test.....per gal	7½	@	8
Black, 30 gravity, 15 cold test.....	8½	@	9
Jack, 30 gravity, summer.	6½	@	7
Cylinder light, filtered.....	15	@	20
Cylinder, dark, filtered	12	@	15
Cylinder, dard, at'm refined	10	@	18
Paraffine, 23½ @ 24 gravity.	13½	@	14
Paraffine, 26 gravity.....	12½	@	13
Paraffine, 28 gravity.....	9½	@	10
Paraffine, red, 21 @ 22 gr'ty	..	@	..
Paraffine, red, 23½@23 gr'ty	13	@	14

Paints and Colors.

Barytes, Foreign, ₩ ton.	$23.00	@	$24.00
Barytes, Amer. floated...	30.00	@	32.00
Barytes, Amer. No. 1....19.00		@	20.00
Barytes, Amer. No. 2....13.00		@	16.00
Barytes, Amer., No. 3....11.00		@	12.00
Blue, Celestial..... ₩ ℔	6	@	8
Blue, Chinese	50	@	55
Blue Prussian.....	25	@	40
Blue, Ultramarine	8	@	25
Brown, Spanish	½@		1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk.	3.10	@	..
Carmine, No. 40, in boxes or barrels	3.20	@	..
Carmine, No. 40, in ounce bottles.....	4.20	@	..
Chalk, in bulk..... ₩ ton.		@	2.00
Chalk, in bbls..₩ 100 ℔.	32	@	40
China Clay, English..... ₩ ton.	13.00	@	18.00
Cobalt Oxide, prep'd....	2.90	@	....
Cobalt Oxide, black.. .... lots 100 ℔.	2.60	@	....
Cobalt, Oxide, black..... less 100 ℔	2.65	@	....
Green, Paris, in bulk.....	14	@	15¼
Green Paris, 170 @ 175 ℔ kegs.....	14½	@	15¾
Green, Paris, small pack.	16	@	21¾
Green, Chrome, ordinary	8	@	11
Green, Chrome, pure....	22	@	25
Lead, Eng., B.B. white....	8½	@	10
Lead, Amn. White, dry or in oil:			
Kegs, lots less than 500 ℔....		@	7¼
Kegs, lots 500 ℔ to 5 tons....		@	7
Kegs, lots 5 tons to 12 tons..		@	6¾
Kegs, lots 12 tons and over..		@	6½
Lead White in oil 25 ℔ tin pails add to keg price.....		@	⅛
Lead, White, in oil, 12½ ℔ tin oils, add to kegg rice		@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2½
Lead, Red, bbls. and ¼ bbls....	6½	@	7½
Lead, Red, kegs.....	6¾	@	7½
Litharge, kegs.....	6¾	@	7½
Litharge, bbls. and ½ bbls....	6¾	@	7¼

Terms, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2¼ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1½
Ocher, French Washed.....	1½@		2½
Ocher, German Washed....	1½@		3
Ocher, American.....	½@		1½
Orange Mineral, English...	9	@	9½
Orange Mineral, French....	10	@	10½
Orange Mineral, German ..	9½@		10
Orange Mineral, American..	8	@	8½
Paris White, English Cliff-stone.....	1.00	@	1.15
Paris White, American.....	70	@	75
Red, Indian, English.....	5½@		7
Red, Indian, American....	2	@	6½
Red, Turkey.....	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American.. ₩ 100 ℔.	1.00	@	1.25
Red, Venetian, English....	1.00	@	1.50
Sienna, Italian, Burnt and Powd. ₩ ℔	5	@	6½
Sienna, Ital., Burnt Lumps	1½@		2½
Sienna, Ital., Raw, Powd..	2	@	6½
Sienna, Ital., Raw Lumps..	2	@	2½
Sienna, American, Raw....	1½@		1¾
Sienna, American, Burnt and Powdered.....	1½@		1¾
Talc, French.....	1½@		1½
Talc, American.....	1	@	1¼
Terra Alba, Fr'ch. ₩ 100 ℔	90	@	1.00
Terra Alba, English	50	@	60
Terra Alba, American No.1	70	@	75
Terra Alba, American No.2	40	@	50
Umber, Turkey, Bnt. and Powd.. ₩ ℔	3½@		4
Umber, Turkey Bnt.Ln	2½@		3
Umber, Turkey, Raw and Powdered.....	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome.....	10	@	25
Vermilion Americ. Lead..	11½@		17
Vermilion, Quicks'er, bulk.	64	@	66
Vermilion, Quicks'er, bags.	65	@	67
Vermilion Quicksilver, smaller pkgs.....	69	@	71
Vermilion English Import	30	@	35
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste.....	87½@		90
Vermilion, Chinese.....	90	@	95
Whiting, Common. ₩ 100 ℔	40	@	45
Whiting, Gilders'.....	50	@	55
Zinc, American, dry.... ₩ ℔	4½@		5
Zinc, French, Red Seal....	..	@	8½
Zinc, French, Green Seal..	..	@	8½
Zinc, French, V. M. X.....	..	@	7
Zinc, Antwerp, Red Seal....	..	@	7¼
Zinc, Antwerp, Green Seal	..	@	8½
Zinc, German, L. Z. O....	..	@	8½
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10½@		11¼
lots less than 1 ton	11	@	11¾
Zinc, V. M. in Poppy Oil, Red Seal.....	..	@	..
lots of 1 ton and over....	10	@	10½
Lots of less than 1 ton...	10½@		10¾

Discounts.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese..... ₩ ℔	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramarine.....	12	@	18
Brown, Vandyke.....	7	@	13
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber Raw.....	7	@	10
Umber, Burnt	7	@	10

Putty.

In barrels and ⅛ bbls....	1.35	@	1.45
in tubs.....	.01¼	@	.01⅜
In tin cans.....	.01½	@	.02¼
In bladders.....	.01¼	@	.03¼

Spirits Turpentine.

In regular bbls.....	36½	@	..
In machine bbls.....	37½	@	..

Glue.

Low Grade..... ₩ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	15
Irish.....	13	@	..

CURRENT METAL PRICES.

OCTOBER 21, 1891.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron: ⅜ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in...	₩ ℔ 1.90 @ 2.00¢
Refined Iron: ⅜ to 2 in. round and square. 1 to 4 in. x ⅜ to 1½ in... 4½ to 6 in. x ⅜ to 1 in. 1 to 6 in. x ½ and 5-16	₩ ℔ 2.00 @ 2.20¢
Rods—⅜ and 11-16 round and sq.	₩ ℔ 2.10 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12	₩ ℔ 2.30 @ 2.50¢
"Burden Best" Iron, base price	₩ ℔ 3.00¢
Burden's "H. B. & S." Iron, base price	₩ ℔ 2.80¢
"Ulster"	₩ ℔ 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.00¢

Merchant Steel from Store.

	Per pound
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots.	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
10 to 16	₩ ℔ 3.00 @ 3.00¢	3.35	@ ¢
17 to 20	₩ ℔ 3.15 @ 3.25¢	3.35	@ 3.75 ¢
21 to 24	₩ ℔ 3.35 @ 3.35¢	3.60	@ ¢
25 and 26	₩ ℔ 3.35 @	3.60	@ ¢
27	₩ ℔ 3 50 @ 3.62½¢	3.85	@ ¢
28	₩ ℔ 3.65 @ ¢	4.10	@ ¢

	B. B.	2d quai.
Galv'd, 14 to 20,	₩ ℔, 4.75 @	4.60 @ ¢
Galv'd, 21 to 24,	₩ ℔, 5.12 @	5.00 @ ¢
Galv'd, 25 to 26,	₩ ℔, 5.50 @	5.35 @ ¢
Galv'd, 27	₩ ℔, 5.90 @	5.70 @ ¢
Galv'd, 28	₩ ℔, 6.25 @	6.10 @ ¢
Patent Planished	₩ ℔ A 10¢	B, 9¢
Russia	₩ ℔ 10½¢ @ 11¢	
American Cold Rolled B. B.	₩ ℔ 5¢ @ 7¢	
Craig Polished Sheet Steel	₩ ℔, 8½¢	

English Steel from Store.

Best Cast	₩ ℔ 15 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged, Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 15 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 15 ¢
2d quality	₩ ℔ 14 ¢
3d quality	₩ ℔ 12½¢
R. Mushet's "Special"	₩ ℔ 48 ¢
" " "Titanic"	₩ ℔ 20 ¢

METALS.

Tin.

	Per ℔
Banca, Pigs	22½¢
Straits, Pigs	22 ¢
Straits in Bars	24 ¢

Tin Plates.

Charcoal Plates.—Bright.

			Per box.
Melyn Grade	IC, 10 x 14	@	$6.75
" "	IC, 12 x 12	@	7.00
" "	IC, 14 x 20	@	6.75
" "	IC, 20 x 28	@	13.70
" "	IX, 10 x 14	@	8.25
" "	IX, 12 x 12	@	8.50
" "	IX, 14 x 20	@	8.25
" "	IX, 20 x 28	@	16.50
" "	DC, 12½ x 17	@	6.25
" "	DX, 12½ x 17	@	7.75
Calland Grade	IC, 10 x 14	@	6.70
" "	IC, 12 x 12	@	6.95
" "	IC, 14 x 20	@	6.60
" "	IX, 10 x 14	@	7.85
" "	IX, 12 x 12	@	8.20
" "	IX, 14 x 20	@	7.85
Allaway Grade	IC, 10 x 14	@	6.35
" "	IC, 12 x 12	@	6.50
" "	IC, 14 x 20	@	6.35
" "	IC, 20 x 28	@	12.40
" "	IX, 10 x 14	@	7.50
" "	IX, 12 x 12	@	7.80
" "	IX, 14 x 20	@	7.50
" "	IX, 20 x 28	@	15.00
" "	DC, 12½ x 17	@	6.80
" "	DX, 12½ x 17	@	7.00

Coke Plates.—Bright.

Steel Coke.—IC,	10 x 14, 14 x 20	@	$5.70
	10 x 20	@	8.10
	20 x 28	@	11.70
	IX, 10 x 14, 14 x 20	@	6.60
BV Grade.—IC,	10 x 14, 14 x 20	@	5.70

Charcoal Plates.—Terne.

Dean Grade.—IC,	14 x 20	@	$5.60
	20 x 28	@	10.75
	IX, 14 x 20	@	6.80
	20 x 28	@	12.50
Abecarne Grade.—IC,	14 x 20	@	5.40
	20 x 28	@	10.75
	IX 14 x 20	@	6.35
	20 x 28	@	12.35

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	@ $13.50
IXX, 14 x 28	112 sheets	@ 13.75
IXX, 14 x 31	112 sheets	@ 15.25

Copper.

Duty: Pig, Bar and Ingot, 1½¢; Old Copper, 1¢ ₩ ℔. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot

Lake	@ 13½¢
Ansonia Grade Arizona	@ 13 ¢
Ansonia Grade Casting	@ 12½¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890. Subject to a discount of 10 % @ 20 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

	16 oz.	14 oz.	12 oz.	10 oz.
All Bath Tub Sheets				
Per pound	$0.27	0.29	0 31	0.35

Bolt Copper, ⅜ inch diameter and over, per pound ..... 22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

— % discount.

Tinning.

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

Not larger than 30 x 60.

16 oz. and heavier	24¢ ₩ ℔
14 oz.	25¢ ₩ ℔
12 oz.	27¢ ₩ ℔

Seamless Brass and Copper Tubes.

Net.

Sept. 16, 1891.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1¼
8-14	6-12	35	31	28	27	26	25	23
15	13	36	31	29	28	27	26	23
16	14	37	32	30	29	28	27	23
17	15	38	33	31	28	29	28	24
18	16	40	34	32	30	29	28	25
19	17	41	35	33	32	31	30	27
20	18-19	42	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	39	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper Bronze and Gilding Tube, 2¢ ₩ ℔ additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ ℔
Bronze Tubing, 2¢ ₩ ℔ more than Brass.	
Discount from list	20 @ .. %

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass:	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	2	10	12	14	16	18	20	22
and including	10	12	14	16	18	20	22	24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass:	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	24	26	28	30	32	34	36	38
and including	26	28	30	32	34	36	38	40
To No. 20, inclusive	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.68
Nos. 25 and 26	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28	.39	.42	.45	.49	.53	.58	.65	.75

Discount from List 25 %.

Brass and Copper Wire.

Old English guage standard.	Com. high brass. Per ℔.	Low brass. Per ℔.	Gild'g br'ze & copper Per ℔
All Nos. to No. 16, inclusive	$0.23	$0 26	$0.30
No. 17 and No. 18	.23	.27	.31
No. 19 " " 20	.24	.28	.32
No. 21	.25	.29	.33
No. 22	.26	.30	.34
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.58
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.83
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

— % discount.

Spring Wire, 2¢ ₩ ℔ advance.

Copper Belt and Hose Rivets and Burrs.

	Per ℔.		Per ℔.
No. 5	49¢	No. 11	56¢
No. 6	49¢	No. 12	58¢
No. 7	49¢	No. 13	60¢
No. 8	50¢	No. 14	65¢
No. 9	52¢	No. 15	70¢
No. 10	54¢		

— % discount.

Tobin Bronze—Rods.

¼ inch and larger ..... 17¢ ₩ ℔, net

Tobin Bronze—Piston Rods.

1½ inch and smaller	18¢ ₩ ℔, net
Over 1½ inch	20¢ ₩ ℔, net

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 ℔.

Western Spelter	6¢
Bertha (pure)	8¼¢ @ 9 ¢

Zinc.

Duty; Sheet, 2½¢ ₩ ℔.

600 ℔ casks	7¼¢
Per ℔	7¾¢

Lead.

Duty: Pig, $2 ₩ 100 ℔. Old Lead, 2¢ ₩ ℔. Pipe and Sheets, 2½¢ ₩ ℔.

American	4¾
Bar	5¼¢
Pipe, subject to trade discount	¢
Tin-Lined Pipe, subject to trade discount	15
Block Tin Pipes, subject to trade discount	37½¢
Sheet, subject to trade discount	7¼¢

Solder.

½ @ ½ (Guaranteed)	14¢
No. 1	12¢
Extra Wiping	11½¢ @ 13¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ ℔ 14½ @ 15 ¢
Hallett's	" @ 12 ¢

ALUMINUM.

Prices in Ingots.

In lots of 2000 ℔ and over ..... ₩ ℔ .80¢

Old Metals.

(Prices Paid in New York.

Heavy Copper	₩ ℔ 10 ¢
Light Copper	₩ ℔ 9 ¢
Heavy Brass	₩ ℔ 7 ¢
Light Brass	₩ ℔ 6 ¢
Lead	₩ ℔ 3½¢
Tea Lead	₩ ℔ 3½¢
Zinc	₩ ℔ 3½¢
No. 1 Pewter	₩ ℔ 14 ¢
No. 2 Pewter	₩ ℔ 7 ¢
Wrought Scrap Iron	₩ gross ton $17.00
Heavy Cast Scrap	₩ gross ton 10.00
Stove Plate Scrap	₩ gross ton 7.00
Burnt Iron	₩ gross ton 5.00